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Report No: ICR00004831

IMPLEMENTATION COMPLETION AND RESULTS REPORT

ON A

GRANT

IN THE AMOUNT OF US$11.30 MILLION (TF-10422 and TF-97126)

AND AN ADDITIONAL FINANCING OF US$5.19 MILLION (TF-10422 and TF-97126)

TO THE

REPUBLIC OF INDIA

FOR THE

Financing Energy Efficiency at MSMEs Project
December 13, 2019

Environment, Natural Resources & The Blue Economy Global Practice
Sustainable Development
South Asia Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective {May 14, 2019})

Currency Unit	=	Indian Rupees (INR)
70.42	=	US$1

FISCAL YEAR
April 01 - March 31

Regional Vice President:	Hartwig Schafer
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ABBREVIATIONS AND ACRONYMS

AF	Additional Finance
BEE	Bureau of Energy Efficiency
CAS	Country Strategy [FY 2009-2012]
CEEP	Chiller Energy Efficiency Project [CEEP] [P100584/P102790/P100530]
CO2	Carbon Dioxide
CO2e	Carbon Dioxide Equivalent
CPF	Country Partnership Framework [FY 2018-2022]
CPS	Country Partnership Strategy [CPS, FY 2013-2017]
DPR	Detailed Project Report
EA	Environmental Assessment
EE	Energy Efficiency
EHS	Environmental Health Safety
EMP	Environmental Management Plan
EnMS	Energy Management Systems
ER	Emission Reduction
ESMF	Environmental and Social Risk Management Framework
FEEMP	Financing Energy Efficiency at MSMEs Project
FI	Financial Institution
GAAP	Governance and Accountability Action Plan
GEF	Global Environmental Facility
GEO	Global Environmental Objective
GHG	Greenhouse Gas
GoI	Government of India
GDP	Gross Domestic Product
IBRD	International Bank for Reconstruction and Development
IA	Implementing Agency
ICR	Implementation Completion Review
IGDPRs	Investment Grade Detailed Project Reports
INDC	India's Nationally Determined Contributions
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt fir Wiederaufbau
MDG	Millennium Development Goal
MoEFCC	Ministry of Environment, Forests and Climate Change
MOU	Memorandum of Understanding
M&E	Monitoring and Evaluation
M&V	Monitoring and Verification
MTR	Mid Term Review
MSME	Micro Small and Medium Enterprise
NMEEE	National mission for Enhanced Energy Efficiency
PDO	Project Development Objectives
PLGs	Performance Linked Grants
PMU	Project Management Unit
R&D	Research and Development
RBI	Reserve Bank of India
REA	Resource Efficiency Assessment

RECP	Resource Efficiency and Cleaner Production
RF	Revolving Fund
SME	Small and Medium Enterprise
SIDBI	Small Industries Development Bank of India
TA	Technical Assistance
TOE	Tons oil equivalent
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
4E Solutions	End-to-End Energy Efficiency Solutions

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DATA SHEET

BASIC INFORMATION

Product Information

Project ID	Project Name
P100530	INDIA - Financing Energy Efficiency at MSMEs
Country	**Financing Instrument**
India	Investment Project Financing
Original EA Category	**Revised EA Category**
Partial Assessment (B)	Partial Assessment (B)

Organizations

Borrower	Implementing Agency
Republic of India	Bureau of Energy Efficiency, Small Industries Development Bank of India, Ministry of Environment Forest and Climate Change

Project Development Objective (PDO)

Original PDO

To increase demand for energy efficiency investments in target micro, small and medium enterprise clusters and to build their capacity to access commercial finance. The Project Development Objective supports the global environmental agenda of stabilizing atmospheric concentrations of greenhouse gases (GHG) through an increase in Energy Efficiency investments and resulting energy savings.

FINANCING

	Original Amount (US$)	Revised Amount (US$)	Actual Disbursed (US$)
World Bank Financing			
TF-10422	13,335,000	13,335,000	11,972,779
TF-97126	3,670,000	3,155,000	2,105,964
Total	**17,005,000**	**16,490,000**	**14,078,743**
Non-World Bank Financing			
Borrowing Agency	200,000	200,000	0
Borrowing Country's Fin. Intermediary/ies	46,000,000	70,800,000	51,933,417
Total	**46,200,000**	**71,000,000**	**51,933,417**
Total Project Cost	**63,205,000**	**87,490,000**	**66,012,160**

KEY DATES

Approval	Effectiveness	MTR Review	Original Closing	Actual Closing
27-May-2010	28-Oct-2010	11-Feb-2013	31-Dec-2014	04-May-2019

RESTRUCTURING AND/OR ADDITIONAL FINANCING

Date(s)	Amount Disbursed (US$M)	Key Revisions
30-Dec-2014	4.31	Change in Results Framework Change in Components and Cost Change in Loan Closing Date(s) Reallocation between Disbursement Categories Change in Implementation Schedule
12-Oct-2016	7.65	Additional Financing Change in Results Framework Change in Components and Cost Change in Loan Closing Date(s) Change in Financing Plan Change in Legal Covenants Change in Implementation Schedule Other Change(s)

KEY RATINGS

Outcome	Bank Performance	M&E Quality
Highly Satisfactory	Highly Satisfactory	Substantial

RATINGS OF PROJECT PERFORMANCE IN ISRs

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US$M)
01	05-Dec-2010	Satisfactory	Satisfactory	0
02	27-Jun-2011	Satisfactory	Moderately Satisfactory	.08
03	01-Feb-2012	Satisfactory	Moderately Satisfactory	.21
04	08-Oct-2012	Satisfactory	Moderately Satisfactory	.32
05	24-Apr-2013	Moderately Satisfactory	Moderately Unsatisfactory	.67
06	28-Oct-2013	Moderately Satisfactory	Moderately Unsatisfactory	1.15
07	14-Dec-2013	Moderately Satisfactory	Moderately Unsatisfactory	1.52
08	27-May-2014	Moderately Satisfactory	Moderately Satisfactory	2.98
09	02-Dec-2014	Moderately Satisfactory	Moderately Satisfactory	3.83
10	22-Mar-2015	Satisfactory	Satisfactory	4.88
11	12-Aug-2015	Satisfactory	Satisfactory	5.47
12	26-Feb-2016	Satisfactory	Satisfactory	6.95
13	28-Jun-2016	Satisfactory	Satisfactory	7.62
14	10-Jan-2017	Satisfactory	Satisfactory	7.77
15	01-Nov-2017	Satisfactory	Satisfactory	10.30
16	10-May-2018	Satisfactory	Satisfactory	11.54
17	07-Dec-2018	Satisfactory	Satisfactory	12.74

SECTORS AND THEMES

Sectors

Major Sector/Sector	(%)
Financial Sector	**27**
Banking Institutions	20
Other Non-bank Financial Institutions	7
Energy and Extractives	**73**
Public Administration - Energy and Extractives	10
Other Energy and Extractives	63

Themes

Major Theme/ Theme (Level 2)/ Theme (Level 3)	(%)
Private Sector Development	**100**
Jobs	100
Finance	**28**
Financial Infrastructure and Access	28
Financial inclusion	28
Environment and Natural Resource Management	**72**
Climate change	72
Mitigation	72

ADM STAFF

Role	At Approval	At ICR
Vice President:	Isabel M. Guerrero	Laura Tuck
Country Director:	N. Roberto Zagha	Junaid Kamal Ahmad
Director:	John Henry Stein	John A. Roome
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I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

A. CONTEXT AT APPRAISAL

Context

1. In 2007, the overall energy deficit in India was estimated at 10 percent, and peak power deficit exceeded 17 percent. In view of this, the 11th five Year Plan and the Integrated Energy Policy of the National Planning Commission, Government of India (GoI) recognized the need to address energy shortfalls while also mitigate the demand for energy in the future. At the time of project conceptualization, it was established that to meet Millennium Development Goals (MDGs) India would have to maintain its economic growth rate. India's growing manufacturing sector would be key to accelerating the economy aimed at a GDP growth rate of 8-10 percent during 2005-2010. India has some 36 million Micro-Small-Medium Enterprises[1] (MSMEs) which represent 80 percent its industrial enterprises. These MSMEs contributed 45 percent of India's industrial production, 17 percent of GDP, 40 percent of exports, and provided more than 45 percent of employment in the industrial sector. However, large numbers of Indian MSMEs were resource-intensive, employing inefficient and employed outmoded technologies resulting in rising energy consumption and costs. Analysis of some energy intensive sectors showed that energy consumption of MSMEs could be 33-75 percent of the total industrial energy consumption[2]. As part of its climate change agenda, the GoI had voluntarily committed to reducing country's carbon intensity by 20-25 percent by 2020 compared to 2005 levels.

2. The project was designed to introduce energy efficiency (EE) measures in energy intensive sectors of MSMEs at scale to improve their global competitive advantage and to reduce greenhouse gases (GHG) emissions. Several schemes had been introduced by GoI providing financial incentives and other interventions to address technology improvements and performance efficiency. Energy intensive enterprises could have reaped direct benefits by adopting efficiency and conservation measures as well as by availing GoI schemes. However, uptake of these schemes was not as successful as anticipated due to several barriers and market failures.

3. In India, energy audits and implementation of their recommendations were always been viewed from the perspective of compliance by enterprises even though implementation of recommendations of the audits could result in direct and high benefits. Very few recommendations from energy audits translated into actual investments due to lack of adequate and deep technical know-how, inability to comprehend government schemes and benefit from them, lack of ability and/or willingness to pay for technical advice, limited or no access to external finance, and high transaction costs.

4. MSMEs did not have access to business-friendly, timely and adequate finance at competitive rates from financial institutions (FIs). As EE investments do not generate additional revenue and since the format of the energy audit reports was not amenable to EE being treated as a bankable, EE initiatives were not seen in the realm of traditional financing options by the FIs. Due to the semi-formal nature of MSMEs, they often failed to meet the credit norms of FIs. Where the MSMEs were willing to invest in EE options, it was difficult for them to find appropriate and reliable vendors, those whose products and services were geared for the smaller enterprises. In this context, this project (FEEMP) financed technical assistance (TA) and grants to increase

[1] Defined as per Reserve Bank of India as an enterprise based on investment in plant and machinery – investment below INR 2.5 million as micro enterprises, between INR 2.5 million and 50 million as small enterprises, and between INR 50 million to 100 million as medium enterprises.

[2] World Bank Study 'Energy Intensive Sectors of the Indian Economy: Option for Low-Carbon Development'

investments in EE to help MSMEs improve manufacturing efficiency and in turn achieve a public good by mitigating and/or reducing GHG emissions.

5. It was well acknowledged at appraisal that a standalone Global Environment Facility (GEF) project could not overcome broader issues faced by MSMEs in accessing finance. FEEMP was conceived to complement the World Bank's engagement with GoI on the $520 million IBRD-funded SME Finance and Development Project (SMEFDP, P086518 and P102767). Through the Small Industries Development Bank of India (SIDBI) as the financial intermediary, the SMEFDP sought to effectively overcome barriers to financing EE in specific sectors and simultaneously increase demand for SIDBI's lending products in the long term. While SMEFDP targeted SME growth, competitiveness and employment creation through access to finance and business development services, the GEF-funded FEEMP was designed to increase the flow of capital for EE measures and address institutional weaknesses and capacity constraints of FIs that restricted them from supporting MSMEs.

6. **Rationale for Bank Involvement**. The World Bank's experience in working in the domain of EE in India, and with Indian SMEs through financial intermediaries provided a strong rationale for the Bank to be the executing agency for this GEF-financed project. The Bank had developed a GEF Programmatic Framework for EE in India, approved in 2008 by the GEF Council. The Framework aimed at increasing market penetration of EE technologies in buildings, SMEs and railways[3]. TA provided by the World Bank on 'Developing Financial Intermediation Mechanisms in China, India and Brazil' resulted in five pilots being launched by Indian banks. At appraisal, FEEMP supported the sustainable growth pillar of World Bank Country Assistance Strategy for India (CAS) for FY2009-12.

Theory of Change (Results Chain)

7. The Theory of Change is as described in Figure 1.

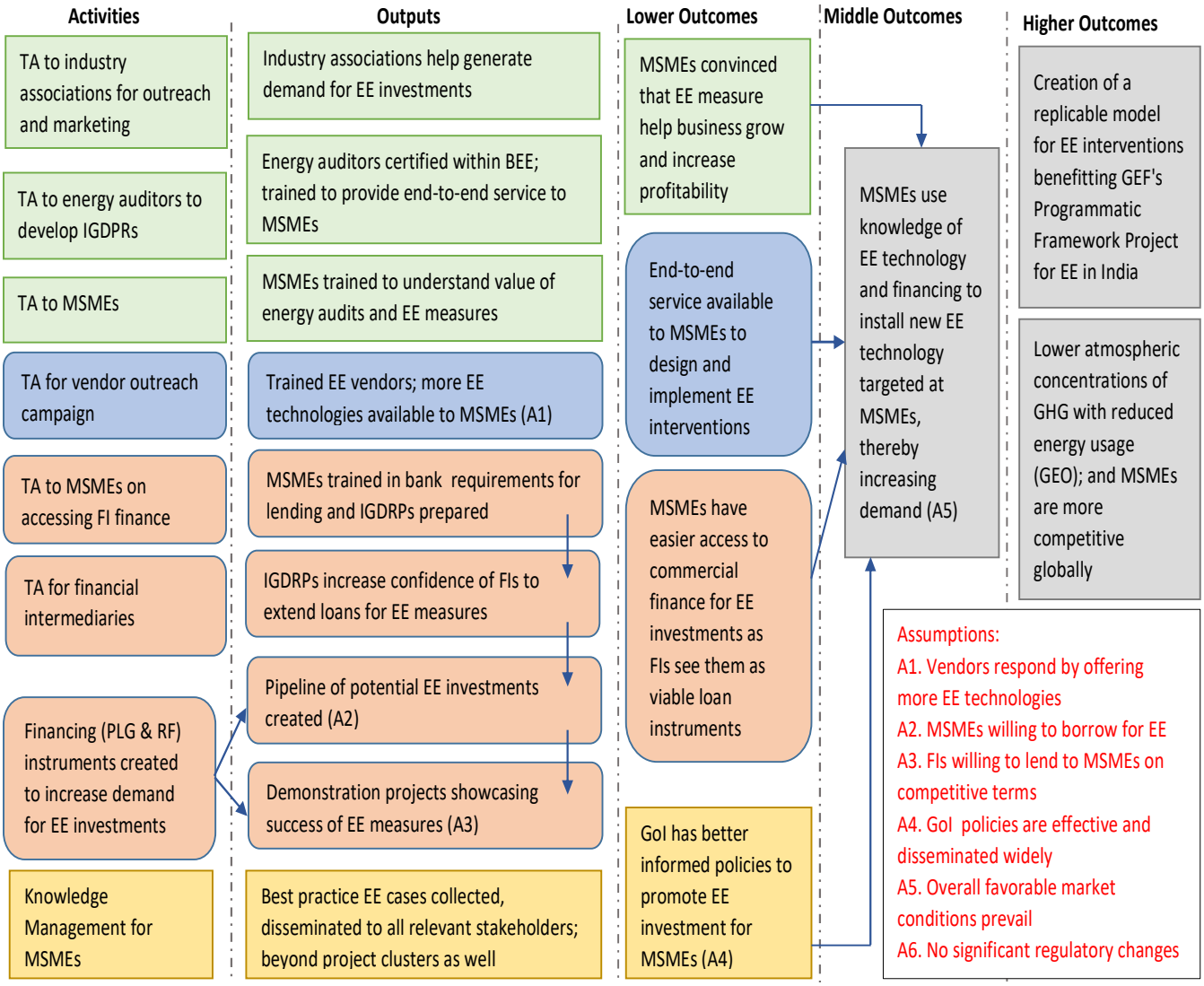
Project Development Objectives (PDOs)

8. The objective of the Project was to increase demand for energy efficiency investments in target micro, small and medium enterprise clusters and to build their capacity to access commercial finance.

9. The PDO supported the Global Environmental Objective (GEO) of stabilizing atmospheric concentrations of GHG through an increase in EE investments and resulting energy savings.

[3] Objective was to be achieved through implementation of five distinct projects including this one.

Figure 1: Theory of Change for the Project



Key Expected Outcomes and Outcome Indicators

10. The project targeted an increased demand for EE investments in five target MSME clusters[4,5], development of detailed project reports on EE interventions in 500 MSMEs, and investment in EE goods and services exceeding

[4] Ankaleshwar, Faridabad, Kolhapur, Pune, Tirunelveli. Selection criteria included number of MSMEs, energy usage and intensity, EE potential and availability of proven EE technologies, MSME financial health and ability to access finance, strength of potential apex organizations, and replication potential. These represented four major categories of industries – chemical, forging, foundry and limekilns – in addition to mixed clusters.

[5] In the context of this project, a cluster is defined as a group of end-users who share similar energy use characteristics. It includes

$46 million including mobilized commercial finance. Further, the project sought to enhance the capacity of some 1,300 MSMEs and 1,000 FI personnel to create a more robust market for EE investments.

11. Progress of the project was to be monitored through the following ***outcome indicators***:
    (a) Number of Investment Grade Detailed Project Reports (IGDPRs) prepared to facilitate EE investments;
    (b) Total investment in EE goods and services in targeted MSME Clusters from enterprises receiving TA support, estimated to exceed US$46 million including mobilizing commercial finance; and
    (c) Anticipated annual and cumulative total energy savings expressed in kWh and tons of oil equivalent (TOE) resulting from EE measures that successfully accessed commercial finance.

12. The Project's ***Global Environment Objective***, mentioned in the previous section, was assessed by measuring CO_2e emission reduction resulting from the energy savings due to EE investments facilitated by the project. It was targeted to reduce global CO_2e emissions by 4.8 million tons over the lifetime of the equipment installed.

13. Additional benefits to participating MSMEs and FIs that could not be measured included the following: reduced local pollution, enhanced product quality, improved asset quality of FIs, increased employment impacts from increased demand for EE goods and services, and increased market competitiveness.

Components

14. The project was designed to be implemented by BEE and SIDBI as part of the Bank's larger SME EE program discussed under Rationale for Bank involvement (paragraph 6). The total Project cost at the time of appraisal was US$57.5 million (GEF Grant of US$11.3 million and leveraging of private sector finance US$46.2 million including US$200,000 borrower's contribution).

Component 1 - Building Capacity and Awareness for EE (original cost: US$3.9 million):

15. This component focussed on increasing EE-related awareness of MSMEs and FIs, along with EE service providers and vendors, through outreach efforts, documentation and dissemination of information on successful projects, and building the capacity of these stakeholders through trainings, expoosure visits and other related activities, including:

(i) outreach efforts, dissemination of information on successful projects, and packaging of potential investment proposals in EE for financing at cluster and enterprise level;
(ii) facilitating access to finance, vendor outreach and selection for select enterprises to create a viable body of demonstration projects;
(iii) marketing and outreach efforts to selected clusters, and capacity building of industry associations; and
(iv) trainings, audits, BEE certifications, awards and other engagement activities.

Component 2: Increasing EE investments (original cost: US$5.9 million; catalyzing US$46 million through private sector financing)

16. This component contributed to the growth of energy efficiency investments in the Indian MSME sector that are financed from local commercial financing sources through project development support and through deployment of performance linked grants (PLGs) for demonstration purposes. This was aided by:

both a specific sector and technology focus and a geographic focus for grouping enterprises and may include several industrial categories which share similar potentials for specific technical interventions. End user eligibility will not be limited to GoI definition of medium, rather it is based upon alternative thresholds developed with local industry associations, SIDBI and BEE, including annual turnover.

(i) TA to develop initial pipeline of approximately 500 sub-projects in energy areas, and provision of sub-grants thereof; and
(ii) TA and PLGs for demonstration of EE technologies.

Component 3: Knowledge Management and Sharing (original cost: $1.0 million)

17. This component consisted of a broad Programmatic EE Knowledge Management effort, covering monitoring and evaluation including measurement and verification (M&V), documentation and dissemination of best practice examples, and to help better inform GoI policy making and implementation of the entire GEF programmatic effort on improving EE in India. Key tools included:

(i) design and implementation of a strategic knowledge framework;
(ii) facilitation of appropriate regulatory and market transformational regime;
(iii) facilitation of mechanism to address market failures; and
(iv) undertaking promotion campaigns for widespread adoption of EE products and technologies.

Component 4: Project Management (original cost: US$0.5 million):

18. This component supported the two project management units (PMUs) within BEE and SIDBI that jointly implemented the project by financing TA, equipment, goods, and logistical assistance.

B. SIGNIFICANT CHANGES DURING IMPLEMENTATION (IF APPLICABLE)

19. ***Project restructuring in December 2014:*** Based on request from GoI, the restructuring entailed (i) an extension of the loan closing by two years from December 31, 2014 to December 30, 2016; (ii) reallocation of accrued savings of US$3.365 million across project components of which US$3 million went towards the introduction of a revolving fund (RF) to further spur demand for high-value but high-impact EE investments; and (iii) geographical and numerical expansion of outreach of EE measures to more enterprises[6]. The indicator to measure GHG emissions reduction (ER) was nuanced to separately account for and measure the lifetime ERs from direct investments under the project and the potential lifetime ERs by virtue of the project after its closure. Restructuring was approved at Country Director level.

20. ***Additional Financing (AF)[7] in December 2016:*** An AF of US$5.19 million was provided to the project comprising additional allocation of (i) US$0.65 million for capacity building; (ii) US$3.25 million to enhance EE investments; (iii) US$0.89 million towards knowledge management, and (iv) the remaining US$0.40 for Project Management. Project scope was scaled-up to include: (a) adjustment of targets of results indicators committing to a higher reduction (nearly doubling the target) in GHG emissions as a result of the project; (b) facilitating more EE investments (additional US$25 million) through private sector for which additional US$2.5 million allocated to RF; and (c) extending the loan closing date to May 4th, 2019 to ensure synergy of results and meet the emerging EE investments demand from additional 16 MSME clusters[8]. The funds for the AF came from savings from the GEF (cycle IV) financed India Chiller Energy Efficiency Project (CEEP) (P100584/P102790/P100533) due to its early closure. Since both FEEMP and CEEP supported the GEF Programmatic Framework for EE, the savings of US$5.19 million were diverted to FEEMP as AF based on request from GoI. This was approved at Regional Vice President level (as P158033). AF also introduced a legal covenant for EE investment loans through a RF, begun as part of

[6] Five additional clusters were added as part of the restructuring process: Dehradun, Delhi-NCR, Ludhiana, Thane, Varanasi.
[7] See World Bank Report No: PAD1754 for specific details
[8] 16 additional clusters added as part of AF: (i) Ahmedabad-Surat-Vapi-Valsad; (ii) Panipat-Roi-Kundali; (iii) Chandigarh-Ludhiana-Jalandhar; (iv) Rajkot-Morbi; and (v) Coimbatore-Tirupur-Erode-Virudachalam

project restructuring in 2014, to beneficiaries in accordance with the eligibility criteria and selection procedures acceptable to the World Bank and with the SIDBI Operations Manual.

Revised PDOs and Outcome Targets

21. No change was made to the PDO during the life of the project.

Revised PDO Indicators

22. The targets for the PDO indicators were revised at Restructuring of Project (2014) and AF (2016) are as per Table 1.

Table 1: Results Framework with Revised Targets

S. No.	Outcome Indicator	Targets at Appraisal	Revised Targets at 2014 RP	Targets for AF	Total
PDO Indicators					
1.	Number of IGDPRs prepared through TA support	500	500	230	730
2.	Aggregate value of direct EEIs from the project *(INR million)*	970	970	690	1,660
3.	Estimated replicable EEIs *(INR million)*	2,520	2,520	1,380	3,900
4.	Cumulative and estimated lifetime Carbon ERs through direct investments *(million tons of CO_2)*	4.8	1.5	1.05	2.55
5.	Potential cumulative lifetime Carbon ERs *(million tons of CO_2)*	None set	3.6	3.00	6.60

Revised Components

23. The budgetary allocation to project components was revised during Restructuring and AF as detailed above in paragraphs 19 and 20. This revised financing for the project is detailed as per Financing Plan in Data Sheet and Annex 3 provides project cost by component.

Other Changes

None

Rationale for Changes and Their Implication on the Original Theory of Change

24. ***Rationale for restructuring:*** The progress in early 2014 indicated that the project was on track to achieve the target of 500 IGDPRs along with demand from an additional 100 MSMEs to participate in the project. The project had received a favorable response from the MSMEs in implementing EE measures and moving from low or no cost to higher investments with a higher trajectory of energy savings/emission reductions. But the cumulative EE investments would be INR 970-1,200 million, lower than the target of INR 2,150 million. This resulted from EE

investments per MSME being lower than expected due to difficult market conditions[9] faced by the MSMEs. Moreover, about US$3.365 million in savings had accrued as of October 2014 because of lower than estimated bid prices in consultancy contracts and an increase in the value of the US Dollar vis-à-vis INR. It was decided to continue meeting the existing and emerging EE investments demand from MSMEs, as evidenced by investment grade detailed project reports (IGDPRs) and increase the geographical scope to target additional MSMEs. Therefore, the project was extended to (i) implement these investments; (ii) institutionalize the new RF of US$3 million with SIDBI; and (iii) geographically expand the scope of Component 2 which would provide a pipeline for RF in the additional five clusters [10].

25. The RF was introduced in line with project principles of creating customized financial products to increase the appetite for high-value but high-impact EE investments, hitherto not undertaken by most MSMEs due to difficult market conditions and lack of adequate verification of such new technologies[11] downscaled for the MSME sector. RF constituted of 65 percent SIDBI loan from their existing lending products on commercial lending terms, 25 percent of interest free GEF grant (US$3 million), and 10 percent of promoter's contribution. This facilitated interest subvention of 2.5 percent for EE investments. The RF was an option given to MSMEs and they were free to access finance from any financial institution supported by the project since its inception. The RF pilot was rolled out with certain criteria including: (a) suggested investment of INR 3-5 million per MSME; (b) ceiling of US$0.26 million loan per enterprise with grant funding not exceeding US$72,000; (c) loan tenure of 3-5 years; and (d) enterprise should have a long-term investment-grade credit rating.

26. SIDBI was selected to institutionalize the RF since it is a AAA rated entity and finances EE investments in MSMEs through JICA, KfW, AfD and other lines of credit. This reflected the support SIDBI received from GoI as a key public policy contributor towards India's MSME sector.

27. The above-mentioned additional interventions were necessary to address two key issues - the lower per enterprise EE investments due to global financial crisis and economic downturn among MSMEs; and meet the demand for EE interventions arising from other MSME clusters. In the first four years of implementation, it was learned that MSMEs do not implement all identified investments together but stagger the investments according to their requirements and payback. Therefore, the outcome indicator for ERs was made more specific to indicate (a) lifetime ERs through direct investments and (b) potential ERs that might result due to replication of project efforts and assessed through impact evaluation studies.

28. ***Rationale for AF:*** FEEMP had demonstrated successful implementation of its principles in five geographical clusters representing four major categories of industries[12] and was expanding into additional five clusters. There was a strong demand to promote EE measures from GoI and other stakeholders, especially the private sector, into other areas covering more categories of industries. It was felt that expanding project outreach to other energy intensive sectors like pharmaceuticals, ceramics, agriculture, food processing was expected to have a transformational impact and improve the competitive advantage of MSMEs. The AF enabled this to be achieved through (a) replication of proven technologies; (b) demonstration of scaled-down technologies that are proven in large scale enterprises but not available for MSMEs; (c) enterprise level specific intervention; and (iv) development of customized financing instruments for EE technology deployment. Project engagement was expanded to 16 additional clusters: Surat, Ahmedabad, Vapi, Valsad, Morbi and Rajkot in Gujarat; Panipat, Kundli

[9] Global financial crisis, economic downturn lasting several years and perceived loss of business to cheap imports.
[10] Dehradun (Uttarakhand), Delhi-National Capital Region, Ludhiana (Punjab), Thane (Maharashtra) and Varanasi (Uttar Pradesh)
[11] Before project interventions, most of these new EE technologies and equipment were available only to large industries.
[12] The first five clusters included industries in chemical, forging, foundry, lime kilns, and mixed sector. Additional five clusters included during project restructuring in December 2014 were from mixed sector.

and Rai in Delhi-NCR; Ludhiana, Jalandhar and Chandigarh in Punjab; and Coimbatore, Erode, Virudachalam and Tirupur in Tamil Nadu.

29. During implementation of the parent project, it was experienced that EE can be enhanced if resource efficiency and cleaner production (RECP) and EE go together. The process of developing IGDPRs already included information on RECP. While MSMEs saw EE measures appreciably reduce input costs in the form of fuel/energy savings, RECP was welcomed by them as a means of becoming more competitive and enhancing production and profitability.

30. ***Implication on Original Theory of Change:*** No change was made to the Theory of Change during the life of the project.

II. OUTCOME

A. RELEVANCE OF PDOs

Assessment of Relevance of PDOs and Rating

31. Relevance of PDO is rated as High. Over the project implementation period, the PDO and GEO remained consistently relevant to Bank's priorities for India as outlined in CAS 2009-12; CPS 2013-17; and CPF 2018-22. They also supported the intent of GoI's 11th (2007-12) and 12th (2012-17) Five-Year Plans which outlined its commitments on efficient use of resources, cleaner production, creating and enabling environment for investments, more jobs, improving sustainability and competitiveness of the manufacturing sector of MSMEs.

32. At appraisal, the project objectives were relevant to the CAS 2009-12, specifically in supporting the pillars on 'ensuring sustainable development' and 'increasing the effectiveness of service delivery'. FEEMP focused on sound environmental management and sustainable use of resources to increase efficient use of energy, water and other elements that strengthen industrial competitiveness and reduction in GHG emissions which in turn contributed towards improving local environmental conditions. Relevance of FEEMP continued into the next CPS FY2013-17; it contributed towards two of the three Strategic Engagement Areas of CPS – "Integration" and "Transformation" - by achieving the following outcomes: (a) Reduced Greenhouse Gas emissions through energy efficiency and renewable energy production; and (b) Improved market-driven skills for productive employment. At loan closing, the project remained highly relevant to the CPF (FY2018-22) contributing towards two of the three Focus Areas: (a) Promoting Resource-Efficient Growth; and (b) Enhancing Competitiveness and Enabling Job Creation. The project contributed towards the objectives of the CPF as it (a) led to more resource efficient production in several MSME sectors which also led to them becoming more competitive; (b) created a market catering to EE demands of MSME sector; (c)created an enabling and sustainable environment for generating investments for MSMEs in EE/RECP; and (d) contributed towards GHG emission reduction by adopting low cost, scalable and replicable technological options.

33. At inception, the efforts of the project contributed towards GoI's target of increasing energy efficiency as defined in its Eleventh Five Year Plan (2007-2012) and directly supported the National Mission for Enhanced Energy Efficiency (NMEEE) [13] , established under India's National Action Plan on Climate Change. The project

[13] *https://www.beeindia.gov.in/content/nmeee-1*; With a strong focus on energy intensive sectors, NMEEE seeks to enhance

objectives continued to remain relevant, including during the provision of AF in 2016, to GoI's priorities as outlined in the Report[14] of the Working Group on MSME Growth for 12th Five Year Plan (2012-17) by – (a) increasing sustainable productivity in MSMEs; (b) demonstrating environmental sustainability can be achieved through efficient resource management, especially energy; (c) raising private sector finance; (d) reducing GHG emissions in the participating clusters; and (e) improving environment, health and safety conditions at these MSMEs.

34. At closing, the project contributed to GoI's priorities as identified in "India – Three Year Action Agenda[15] (2017-20)"– (a) enhancing industry, trade and services to boost productivity; (b) promoting skill development; (c) demonstrating emission reductions from MSMEs; (d) promoting science, technology and innovations environment; and (e) improving business environment, especially for the MSME manufacturing sector. Further, the project objectives contribute towards the outcomes outlined in Strategy for New India @ 75[16] developed by NITI Aayog, GoI. Enhancement of energy efficiency in industry forms a key component of India's Nationally Determined Contributions (INDC)[17] as part of the climate change agreement at the UNFCCC Conference of the Parties (COP21) in Paris in December 2015. The objectives and outcomes of FEEMP directly supported this commitment's key elements and focus areas including (a) cleaner economic development; (b) reducing emission intensity of GDP; (c) increasing share of non-fossil fuel-based electricity; (d) mobilizing finance; and (e) technology transfer and capacity building.

B. ACHIEVEMENT OF PDOs (EFFICACY)

Assessment of Achievement of Each Objective/Outcome

35. The PDO is unpacked as follows: (a) increase demand for EE investments in target MSME clusters (Table 2); and (b) build capacity of MSMEs (as the means) to access commercial finance.

36. At the initiation of the project, while there was a lack of available aggregate data on total Indian industry energy consumption share by MSMEs, analysis of certain highly consuming subsectors such as iron and steel or pulp and paper indicated that the share of total energy consumption by MSME could exceed 33-75 percent depending on the sub-sector. Thus, improvements in EE in MSMEs could have had a significant total impact on total industrial sector energy consumption for the country. Using combination of TA and Grant finance, the project demonstrated a model to address the gaps that make EE and resource efficiency and cleaner production measures financially attractive and easier to implement. The Project intervened in energy intensive sectors like foundry, forging, textiles, automobile, chemical, etc., in 26[18] clusters in six geographical areas across the country.

energy efficiency through a mix of fiscal instruments, capacity building and shifting the market towards more energy efficient mechanisms.

[14] *https://msme.gov.in/sites/default/files/Report_working_group_5yearplan-2012-17_0.pdf*

[15] *https://niti.gov.in/sites/default/files/2018-12/India_ActionAgenda.pdf*; page 98 outlines the focus on energy efficiency.

[16] *https://niti.gov.in/sites/default/files/2019-01/Strategy_for_New_India_2.pdf*; pages 61-63.

[17] *https://www4.unfccc.int/sites/submissions/INDC/Published percent20Documents/India/1/INDIA percent20INDC percent20TO percent20UNFCCC.pdf; page 11-13, 19, 36.*

[18] Gujarat – Ankaleshwar, Surat, Ahmedabad, Vapi, Valsad, Morbi and Rajkot; Delhi-NCR – NCR, Faridabad, Panipat, Kundli and Rai; Maharashtra – Thane, Pune and Kolhapur; Punjab – Ludhiana, Jalandhar, Amritsar and Chandigarh; Tamil Nadu – Tirunelveli, Coimbatore, Erode, Virudachalam and Tirupur; Uttar Pradesh – Varanasi; Uttarakhand - Dehradun

Table 2: List of 26 target MSME clusters

S.No.	Cluster	Cluster State	Sector	MSMEs			
				Micro	Small	Medium	Total
1	Ankleshwar	Gujarat	Chemical	39	129	7	175
2	Faridabad	Haryana	Mixed	14	177	53	244
3	Pune	Maharashtra	Forging	1	61	13	75
4	Kolhapur	Maharashtra	Foundry	14	65	26	105
5	Tirunelveli	Tamil Nadu	Lime kilns	6	0	0	6
6	Delhi -NCR	Delhi-NCR	Mixed	2	16	7	25
7	Ludhiana	Punjab	Mixed	0	13	10	23
8	Varanasi	Uttar Pradesh	Mixed	8	14	2	24
9	Thane	Maharashtra	Mixed	0	20	3	23
10	Dehradun	Uttarakhand	Mixed	0	13	3	16
11	Ahmedabad-Surat-Vapi-Valsad	Gujarat	Mixed	2	27	16	45
12	Panipat-Rai-Kundli	Haryana	Mixed	4	25	33	62
13	Chandigarh-Ludhiana-Jalandhar	Punjab	Mixed	6	51	13	70
14	Rajkot-Morbi	Gujarat	Mixed	2	54	14	69
15	Coimbatore-Tirupur-Erode-Virudhachalam	Tamil Nadu	Mixed	4	46	20	71
16	Different locations under 4E Scheme	Pan India	Mixed	19	158	47	224
	Total			**121**	**869**	**267**	**1,257**

Objective 1: Increase demand for EE investments in target MSME clusters; rating: High

37. **Earlier, the approach adopted in EE interventions was to focus on only the energy audit and implementation was left to MSMEs themselves. Adopting the approach of end-to-end facilitation and support, this project successfully created a scenario that "Good environment is good business too"**. The TA included MSME outreach, undertaking walk-through audits, detailed energy audits, preparing investment grade detailed project reports (IGDPRs), exploring cost-effective technologies and their vendors, assessing financing options, availing finance from lending institutions, installing technology adapted to MSMEs requirements, commissioning and their operational training, and finally measuring and verifying the results of investments. The entire process was based on the demands and needs of MSMEs and the prevailing market scenario.

38. **The project's outreach campaign contacted more than 9,000 entrepreneurs through extensive marketing and interactions with individual MSMEs and industrial associations. It also facilitated the creation of new EE equipment suitable to the MSME sector.** The entrepreneurs understood the immediate and long-term benefits of EE investments as well as the value of participating in the project due to its end-to-end support strategy. The gap between MSMEs and technology vendors was bridged through 14 business-to-business vendor interface workshops covering all the clusters. Technologies used to achieve EE in larger enterprises were scaled down to meet the special EE equipment needs of MSMEs. Local vendors were trained to manufacture such high-technology equipment and processes while working closely with MSMEs/clusters. Operations staff of MSMEs were trained by vendors to work on the installed equipment. BEE and SIDBI worked to build the capacity of

MSMEs to help them understand the benefits of using efficient technologies and operating the processes efficiently to achieve energy savings.

39. **A total of 1,120 experts from 75 FIs and 750 energy audit professionals were trained to develop energy audit reports on the basis of which commercial finance could be sought.** Interactions with energy auditors, lending institutions and MSMEs resulted in improving the technical and commercial quality of EE investment proposals, produced as a result of detailed energy audits. The IGDRPs, thus developed, were investment ready and sufficiently comprehensive for FIs to use to justify financing EE investments in the MSME sector. The format of IGDPRs convinced several MSMEs to employ internal sources of finance to avail the potential benefits of EE interventions. Energy auditors and FI personnel were trained to prepare and use 1,257 IGDPRs exceeding the project target of 730 IGDPRs by over 70 percent. SIDBI developed Resource Efficiency Assessment (REA) App, titled (SIDBIREA) enabling users to carry out a detailed assessment in the areas of energy efficiency, lean manufacturing, and cleaner production at their facilities. The tool is also available in the form of a mobile App (both for Android and IOS users).

40. **FEEMP recognized the effectiveness of demonstration projects and momentum achieved by early movers to overcome the reluctance of MSMEs to spend on unfamiliar EE interventions, which were considered a non-core activity of their business.** To build momentum for increasing EE investments, the project, through the PLGs, incentivized 67 early adopters of EE measures in each cluster by giving them a one-time cash payment of up to INR 900,000 (US$19,270 equivalent[19]) at 75 percent of the capital expenditure upon demonstration of achievement of actual energy savings through EE interventions as outlined in the respective IGDPRs. In this way, the PLGs provided the much-needed thrust to build an initial pipeline of investments by triggering competition among MSMEs to adopt EE interventions at the earliest to obtain the incentive amount. At the same time, the demonstrated success of such EE interventions instilled confidence among MSMEs for increased uptake of EE investments as well as among FIs for funding such interventions. Due to scale of possible EE interventions PLG was given to 67 MSMEs against the target of 25 enterprises. Against the budget allocation of US$585,000, an amount of US$437,040.50[20] was disbursed as PLGs by December 2016. This lower than expected utilization was partly due to the weakening of the Indian Rupee against the US Dollar in the first few years of project implementation as well as the higher-than conceived cost of EE interventions during project preparation. The objectives of PLGs were fully met by demonstration projects given the successful validation of EE interventions, which largely was due to planning and funding a comprehensive set of EE interventions that cost higher than envisaged during project preparation but were needed to create the requisite level of conviction among other MSMEs. Another key factor for success were the selection criteria (See Annex 7) to avail PLGs, that led to successful demonstration of EE interventions.

41. **Creation of the Revolving Fund (RF) significantly increased the appetite of MSMEs to take up high-cost EE measures**. Institutionalized by SIDBI as "End-to-End Energy Efficiency (4E) Solutions[21], the RF provided a maximum interest subsidy of 2.5 percent. This could be made possible by SIDBI without losing money since 25 percent of the total RF (US$5.5 million) was provided by as grant from the project. In all, pan India 224 MSMEs benefited from the 4E scheme under the project with only 108 MSMEs availing of the interest subsidy from SIDBI. The RF is currently in second round and will likely revolve a third time that goes beyond the project period. Availing RF by enterprises was subject to minimum criteria as detailed in Operating Guidelines of RF.

[19] Exchange rate at project approval 1 US$ = INR 46.7
[20] Exchange rate at project approval was 1 US$ = INR 46.7 and in December 2016 (at time of AF) was 1 US$ = INR 65
[21] *https://sidbi.in/webroot/files/product/3. percent20Financing percent20Schemes percent20for percent20Sustainable percent20Development.pdf*

42. **The AF of US$5.19 million in 2016 along with extension of project period by 30 months allowed for deeper and high-technology interventions.** Based on experience of parent project, the scope was expanded to include investments that would result in more efficient uses of resources (such as water and fuel), leaner manufacturing production practices (usage of lesser material per unit of production) and cleaner production processes leading to significant cost savings and safer work environment during the production processes in MSMEs. IGDPRs provided information not only related to investments that would directly lead to EE but also to investments that would lead to RECP, which invariably results in production cost and energy savings, and thus emission reductions. AF included new clusters from the parent project and therefore needed time to sensitize the MSMEs. As a result, majority of EE investments in AF clusters which were implemented during project period were directly leading to EE realizations since these are low hanging and also led to visible monetary returns. The remaining investments became part of the pipeline for future interventions.

43. The combination of working closely with and based on the demands and needs of MSMEs, facilitating audits for EE and RECP investments by working jointly with energy audit professionals and FIs, and incentives and showcasing EE benefits through innovatively-planned and executed PLGs and RF led to direct EE investments of INR 3,322 million, more than double the project target of INR 1,660 million.

44. **Measurement and verification (M&V) services to 637 enterprises which implemented EE measures closed the operational loop and created verifiable evidence that "good environment can be good business too".** Having a comprehensive reporting system to measure and verify results of EE investments from energy professionals increased the confidence of MSME entrepreneurs, energy professionals, lending institutions and technology vendors in the interventions supported by the project. The effort was taken a step further in assisting select MSMEs in establishing, documenting and implementing an Energy Management System (EnMS) as per ISO 50001[22] standard. Adoption of EnMS allowed 48 enterprises, as against the project target of 40 enterprises, to achieve ISO 15001 certification while also deriving EE benefits on a sustained basis and institutionalizing a culture of energy conservation.

45. **Development of knowledge products including a web-based portal helped promote further adoption of EE products and technologies and spurred creation of other web-based knowledge and decision-making tools by SIDBI and BEE.** The project-funded portal (*http://www.indiasavesenergy.in/*), managed by BEE, hosts learnings especially in the form of demonstration videos, good practices, information on human and technical resources, EE equipment suppliers and vendors, finance schemes and other support systems drawn from projects managed by the World Bank, UNIDO, and UNDP under GEF's overall Programmatic Framework Project for Energy Efficiency in India. SIDBI also developed an Energy Savings Assessment Tool for MSMEs (*http://eetool.istsl.in/*) targeting MSMEs, FIs, and EE service providers. The tool makes it easier for an MSME to calculate potential energy savings from various possible interventions as well as to find the finance and service providers to implement such interventions. GoI also launched guidelines for MSMEs on energy conservation and a knowledge management portal titled "SIDHIEE[23]"[24] focusing on making the MSMEs more competitive and achieving higher growth through adoption of energy efficiency measures.

46. **The project has contributed creation of a viable market for EE interventions in which gains accrue to all stakeholders – MSME entrepreneurs, EE service providers, vendors of EE and clean production equipment, and FIs – by enhancing both the size of businesses and their profitability.** The creation of such a market and subsequent EE and clean production interventions not only benefits the environment but improves the

[22] *https://www.iso.org/iso-50001-energy-management.html*
[23] *https://pib.nic.in/PressReleasePage.aspx?PRID=1585892*
[24] A Hindi word which means accomplishment or attainment.

competitiveness and profitability of participating MSMEs. As a result, it is estimated that the impact of the project will generate a market of INR 16,971 million replicable EE investments, thus exceeding the project target of INR 3900 million by 335 percent. Summarizing, the achievement of the Outcome is assessed through following indicators:

- **PDO Indicator 1**: 1,257 IGDPRs prepared (versus target of 730) – Exceeded by 72 percent
- **PDO Indicator 2**: INR 3,322 million direct EE investments from project (versus target of INR 1,660 million) – Exceeded by 100 percent
- **PDO Indicator 3**: INR 16,971 million replicable EE investments from project[25] (versus target of INR 3,900 million) – Exceeded by 335 percent

Objective 2: Build capacity of MSMEs to access commercial finance; rating: High

47. FEEMP addressed the practical gaps that either discouraged MSMEs from spending on EE investments or placed barrier for them to access commercial finance. Extensive consultations with MSMEs, EE service providers and FIs led to creation of an optimal set of tools and strategic approaches that broke down these barriers, including the myth among MSMEs that EE investments were for the sole purpose of meeting regulatory compliances rather than being actually good for business. The strategy was not only to create a market-based ecosystem where good environment makes good business sense too but to place the MSMEs at the center of this concept; thus, focusing on addressing specific needs, priorities and constraints articulated by them.

48. **The project used a mix of capacity building, financial incentives, and continuous support and guidance to MSMEs duirng the entire process to enhance their access to commercial finance**. MSMEs were free to moblize finance for identified investments from a variety of sources, including their own equity, additional loans from their existing bank, new term loans from another bank, RF through SIDBI's 4E scheme, or other sources. Not only were EE investments undertaken during the project period, but it is expected tha the built up momemtum will result in MSMEs continuing to invest in EE/RECP measures as outlined their respective IGDPRs. While the 4E product was expected to leverage 1:4 investments from the market, the assessment during November 2018 has reflected effective investment leverage of 1:7 with overall Resource Efficiency Investments reaching about US$ 60 million. Estimates show that the impact of the project will generate INR 16,971 million replicable EE investments only in project clusters, thus exceeding the project target of INR 3,900 million by 335 percent. At closing, SIDBI reported that interest subvention under 4E schemes has increased from 2.5 percent to 3.58 percent due to due to increased uptake of RF over past two cycles and increased competition from other FIs (see paragraph 52).

49. **Capacity building and support/guidance**: The project provided specialized training and support to 75 FIs which included a good mix of national and local banks, both from the public sector and the private sector. Through 36 training programs covering all the target MSME clusters, FI staff were trained in understanding EE business and options in addition to undertaking enhanced analyses of EE project applications from IGDPRs shared by the MSMEs. This enabled FIs to expand their outreach to more MSMEs and supporting a larger number of financially feasible EE interventions. Other capacity building tools for MSME entrepreneurs/managers included participation in business-to-business exhibitions, seminars and talks, one-to-one interactions, expsosure visits, and orientation and training programs covering various aspects of EE interventions.

50. The project trained FI sector professionals including financial consultants/chartered accountants working with MSMEs on financial assessment of EE investments and of banks' requirements, further contributing to

[25] Details as per Annex 4

developing IGDRPs and the sustainablity of the project. The training was supplemented by "*a training manual developed which consists of need for energy efficiency, energy efficiency support schemes, and typical energy efficiency projects for MSMEs, insights of Investment Grade Detailed Project Report (IGDPR), Bankers' Appraisal of Energy Efficiency Projects at MSMEs and case studies*[26]". Further, SIDBIREA App enabled users to carry out a detailed assessment in the areas of energy efficiency, lean manufacturing, and cleaner production at their facilities whether they be from the manufacturing or the service sector. The App was useful for all EE service providers, consultants of leaner cleaner production, MSMEs, and the banks/FIs. It resulted in simplyfing the process towards EE/RECP interventions for MSMEs and the EE/RECP consultants while also enabling FIs to simplify business procedures to decide on loan applications. Another key advantage of the App was knowledge exchange and standardization of EE/RECP interventions across various clusters.

51. **Financial incentives**: As stated under Objective 1 (paragraph 40), the PLG provided a one-time cash incentive to participating MSMEs that successfully instituted EE interventions under this scheme on a first-come first-served basis. A total of 99 MSMEs applied for incentives after implementing the requisite EE investments as per the respective detailed energy audit. Based on the M&V carried out by a third-party expert, 67 of the participating 99 MSMEs were found eligible for PLG incentive as per the eligible conditions mentioned in the scheme. Each successful MSME received an incentive of INR 900,000 under this scheme. The PLG process catalyzed the initial thrust to encourage EE investments that demonstrated actual energy savings to other MSMEs. The PLG-related MSMEs were also used to carry out exposure visits for other MSME entrepreneurs, FI staff and EE service providers/vendors. While the total incentive offered under PLG to 67 MSMEs was INR 28.4 million (US$437,040.50[27]), the EE investments made by these 67 MSMEs was INR 262.4 million, more than nine times the incentive amount.

Table 3: Details of MSMEs supported under the PLG incentive scheme

S. No	MSME Cluster	No. of MSMEs that received PLG
1	Ankleshwar - Chemical Cluster	5
2	Faridabad - Mixed Cluster	19
3	Pune - Forging Cluster	14
4	Kolhapur - Foundry Cluster	9
5	Delhi-NCR Cluster	8
6	Ludhiana - Mixed Cluster	4
7	Varanasi- Mixed Cluster	4
8	Thane - Mixed Cluster	1
9	Dehradun - Mixed Cluster	3
	Total	**67**

52. The RF, instituted through SIDBI's 4E scheme, provided interest subsidies of up to 2.5 percent[28], thereby encouraging MSMEs to implement high-value EE and RECP investments. US$5.17 million (INR 330.5 million)[29,30]

[26] Extract from ICR submitted by SIDBI, page 17
[27] Disbursement figures in Operations Portal indicate USD 437,040. Variation due to exchange rate.
[28] Increased further to 3.85 percent by April-May 2019.
[29] Calculated at exchange rate of INR 63.98 = 1US$; the average exchange rate for considering all disbursement under the project.
[30] Variation due to exchange rate

was disbursed by the RF which leveraged an additional INR 1,386.5 million in private lending from SIDBI to 108 MSMEs. An additional 116 MSMEs that participated in the scheme by availing energy audits have chosen to rely upon internal funding as well as finance from sources other than project-supported RF to implement EE/RECP interventions. This was partly a result of competition created amongst FIs to offer competitive rates to MSMEs seeking commercial finance through existing schemes or by creating new schemes specifically catering to MSMEs. By end of project, it was reported that two commercial banks internalized the RECP assessment as part of their loan appraisals. Equally important was the implementation of high-value EE interventions which would not have been possible without this incentive at the initial stages.

53. **Stringent selection criteria ensured participation of serious players in the project**. Walk-through audits and detailed energy audits identified potential EE investments in many MSMEs. The project set stringent criteria for MSME participation including the consent to establish and operate (a legal requirement) from their respective State Pollution Control Boards as well as a good credit rating (financial verification). These helped prevent project benefits from going to laggard enterprises or to those who may not be able to undertake EE interventions due to legal hurdles or their inability to seek commercial finance due to a bad credit rating. Also, SIDBI reported zero Non-Performing Assets (NPAs) after project closing – from the RF. Through the project, target MSMEs were able to access additional commercial finance of INR 3,322 million in direct EE investments, compared to the target of INR 1,660 million, or nearly 100 percent exceeded.

Table 4: Impacts of the Revolving Fund

S. No	Parameter	Unit	Identified
1	MSMEs availed RF benefits	Number	224
2	EE investment identified	INR million	3384.3
3	Estimated monetary savings	INR Million/Year	913.2
4	Average payback period	Months	44
5	Estimated energy savings	TOE/Year	11849
6	Life time Emission Reduction	Million tCO2	2.82

54. **The above factors contributed towards leveraging direct investments of INR 3,322 million as commercial finance showcasing the success of Maximizing Finance for Development approach.** The project adopted an approach that resulted in leveraging maximum private sector finance – a mix of internal financial resources of the MSMEs and loans from commercial banks – to fund EE and RECP measures that led to global public benefits by reducing GHG emissions. The interventions included EE/RECP investments financed by MSMEs, SIDBI's 4E and other schemes, and funding by other FIs. RF was availed by MSMEs beyond project clusters in BEE supported clusters under the Programmatic Framework Project for Energy Efficiency in India[31]. The successful implementation and evidence of benefits will spur other MSMEs to undertake these high-value investments that also result in higher energy cost savings as well as increased profits due to input cost reductions by way of leaner production processes. The FIs also found validated techno-financial models to fund future investments that are a combination of EE/RECP processes. Summarizing, the achievement of this Outcome is assessed through following indicators:

[31] *http://www.indiasavesenergy.in/WebContent/AboutProject.aspx*

- **PDO Indicator 2**: INR 3,322 million direct EE investments from project (Vs target of INR 1,660 million) – Exceeded by 100 percent
- **PDO Indicator 3**: INR 16,971 million estimated replicable EE investments (Vs target of INR 3,900 million) – Exceeded by 335 percent.

Global Environmental Objective: Stabilizing atmospheric concentrations of greenhouse gases (GHG) through an increase in EE investments and resulting energy savings. Rating: High

55. **FEEMP successfully demonstrated the potential of EE measures in MSMEs to reduce their carbon footprints and global GHG emissions.** At appraisal, it was anticipated that the project would support EE investments which would reduce global emissions of CO_2e by 7 million tons over the lifetime of the equipment installed. With INR 3322 million in direct EE investments, 2.72 million tons of CO_2e lifetime carbon ERs was achieved (**Table *5***). Further, 13.34 million tCO_2e lifetime (potential and replicable) ERs are envisaged if the current pipeline of INR 16,970 million worth of EE investments is implemented. Preliminary assessment of BEE work showed a reduction of 0.38 tCO_2e by 2013 but results from any further assessment are not available; thus, these ER values have not been included the project impact calculations. Considering the BAU scenario would have resulted in a reduction of about 4.25 million tons of CO_2e, the project has achieved a total lifetime reduction[32] of 16.06 million tons CO_2e against the target of 9.15 million tons of CO_2e, exceeding the target by over 74 percent.

[32] Calculated by adding 2.72 (direct) and 17.59 (potential and replicable) and subtracting the BAU figure of 4.25 for a total of 51 clusters – 26 direct intervention and 25 indirect interventions where BEE was operating. All figures in million tCO_2e.

Table 5: Outcomes achieved from Direct EE Investments

Project	Cluster	Total Implemented				
		MSMEs (No)	EEI (INR Million)	Annual Monetary Savings (INR Million)	Annual Energy Savings (TOE)	Lifetime Emission Reduction (ton CO_2e)
Original Project	Ankleshwar	148	116.5	101.3	2,392	97,799
	Pune	65	165.5	151.9	3,098	93,965
	Kolhapur	89	160.6	195	2,581	301,591
	Faridabad	244	298.5	287.6	4,952	277,164
	Tirunelveli	0	0	0	0	0
	Delhi NCR	20	67.7	39.8	832	101,477
	Ludhiana	19	90.5	88.7	1,281	99,439
	Varanasi	20	40.3	25	857	17,739
	Thane	20	42.6	20.9	258	23,285
	Dehradun	5	14.9	10.2	148	20,705
	Revolving Fund	71	521.2	274.4	1394	48,6212
	Sub-total	***701***	***1,518.3***	***1194.8***	***17,793***	***1,519,376***
Additional Finance	Ahmedabad-Surat-Vapi-Valsad	45	125	100	5,995	446,660
	Panipat-Rai-Kundli	5	4.3	2	37	4,677
	Chandigarh-Ludhiana-Jalandhar	55	97.8	97.1	1,518	162,047
	Rajkot-Morbi	66	180.8	128.1	802	78,699
	Coimbatore-Tirupur-Erode-Virudachalam	50	53	87.8	1,846	77,762
	Revolving Fund	145	1,343.5	584.4	3,477	427,456
	Sub-total	***366***	***1,804.4***	***999.5***	***13,675***	***1,197,301***
Total Project		**1,067**	**3,322.7**	**21,943**	**31,468**	**2,716,677**

56. **The estimated potential and replicable ERs has been scientifically calculated by SIDBI** considering that the results have been verified and validated by third party M&V agencies and identified by the auditing agencies. Based on validity of each identified EE intervention in the participating MSMEs, the Confederation of Indian Industry[33], an apex industry association, provided cluster-based reports to SIDBI after completion of M&V in initial four clusters namely, Ankleshwar, Faridabad, Kolhapur and Pune. Further, conservative estimates were developed for remaining 22 clusters based on industry experience and the detailed evaluation of the above-mentioned four clusters. Comprehensive calculations and methodology details are available in Annex of the ICR submitted by SIDBI and summary of the same is in Annex 5.

Justification of Overall Efficacy Rating

57. Based on the above assessments, achievement of both project objectives is rated **High.** The GEO shall be achieved considering both the direct investments and potential investments once implemented beyond the project period. Considering the factors discussed in Section III below, the ERs achieved by the project may be considered conservative.

[33] *https://www.cii.in/*

C. EFFICIENCY

58. This section reviews the design, implementation, financial (at enterprise and at the project levels) and economic efficiency of the project, in the context of project closing date extension, additional finance, and other issues encountered by the project.

59. **Design efficiency.** By working with established players such as SIDBI and BEE, the project was easily able to reach out to industry clusters all across the country. As both these organizations also implement projects and programs funded by GoI and several multilateral and bilateral agencies, the learnings and successful approaches from FEEMP were easily integrated into these other large programs/projects aiming to enhance EE in the MSME sector.

60. The project design accounted for the capacity limitations of the various stakeholders and developed an enabling environment for them to interact on a common platform thereby materializing the recommendation of the energy audits into actual energy savings at the enterprise level. The auditors better understood the significance of developing investment-ready reports, provided technology vendors opportunities to innovate technical solutions best suited for MSMEs and FIs to appreciate the bottom-line savings that EE and RECP contributes to MSMEs. The improved understanding of the stakeholders benefited MSMEs in investing in EE and RECP investments which otherwise would have materialized marginally.

61. At the time of design of the project, there were very few examples of successful EE project in the Bank portfolio across regions. In that context, project design was ambitious, ignored the lack of success of similar past projects, and did not anticipate risk of slow implementation from possible meltdown of the manufacturing sector which occurred during 2011-13. However, in effect, by not being overly cautious, the project design allowed for the achieving and exceeding the targets. The somewhat ambitious objectives and targets, appropriate selection of stakeholders, and adequacy of risk and mitigation measures identification, as detailed in 'key factors during implementation' were found to contribute towards design objective of the project. As learning and lessons emerged at various stages of the project, these were successfully integrated into future implementation design and strategies. For example, the reworked approaches during the project extension and then during Additional Finance stage were largely based on a mix of initial design and lessons learned during implementation of the project.

62. **Implementation efficiency**. The section on 'key implementation issues', describes the challenges faced throughout the project and how the project adapted to these. The project had slow progress during 2011-13 mainly due to external factors such as slowdown in the economy and the manufacturing sector itself, or steep competition from cheap imports affecting target MSMEs. The project savings arising due to efficiency in procurement of services and the change in USD-INR exchange rate was used effectively by restructuring the project in 2014 and introducing RF, which led to higher adoption of measures and EE gains by the MSMEs. Once the initial market/external slack was over, the restructured project was implemented efficiently, and it was progressing to close successfully by December 2016, when additional financing became available. During the additional time period available to use the AF, activities were consolidated and enlarged in such ways that another slowdown of the market in 2017-18 did not decelerate implementation.

63. It was critical to the success of the project that it was able to engage FIs, MSME entrepreneurs and local EE experts to create deliverables that emerged from shared knowledge and insight of these multi-stakeholders, thus finding greater relevance and acceptance within the MSME sector. The project had the foresight to engage local consultant firms and individuals that not only possessed a deep knowledge on EE issues and the requisite technical

skills but had been working on issues related to MSMEs for several years. This enabled the work under the project to benefit from the past work done by these consultants at very competitive prices and to place the work in the overall political economy context.

64. The Project resulted in the formation of a market-driven mechanism wherein end-to-end service providers have been created, demonstrated benefits of EE/RECP measures for MSMEs across five clusters have been shared, and inculcated an increased appetite among MSMEs to seek benefits that arise from EE/RECP measures. These developments will ensure that the process of adoption of EE and RECP measures by FEEMP will continue beyond the project period and the market size and the initiatives are expected to rise in the coming years. The IBRD-funded ongoing $520m SMEFDP had picked up lessons from FEEMP on possibilities of upscaling and mainstreaming its approaches to meet its objective related to funding MSMEs towards energy efficiency initiatives. SIDBI established a Green Climate and Sustainable Development Initiatives in 2018 to promote EE and cleaner production in the MSME sector and it is also developing a new initiative – Enhancing Energy Efficiency in MSMEs in India – towards EE interventions in 5000 MSMEs.

65. Due consideration was given to economy and efficiency; all expenditure incurred was as per applicable policies. Most meetings between different stakeholders as well as training programs were conducted using office and meeting spaces of industry associations, BEE and SIDBI to minimize costs. Field meetings were organized in partnership with industry associations and government agencies, thus not only resulting in cost-sharing (thus, cost saving) but also were more effective in bringing together multi-stakeholders for discussions and deliberations.

66. **Financial efficiency at enterprise-level**: At appraisal, it was explicit that savings resulting from energy-efficient interventions was considered enough to make individual MSME-level intervention financially viable (i.e., above 20 percent even if below 30 percent as in the case of small and medium enterprises studies at appraisal). And the hope was that wherever EE intervention were low-cost, a majority of the target enterprises would achieve FIRR of 30 percent and above, with simple payback period ranging from 2 months to 2 years. At completion, this hope was exceeded.

67. Of the 448 non-RF enterprises examined at completion, 441 had a positive FIRR and notably 196 firms had financial internal rate of return (FIRR) more than 100 percent. The high financial profitability of EE measures is evident from the fact that out of 448 firms, only 41 had FIRR below 20 percent as compared to 196 cases with FIRR higher than 100 percent. A further drilled-own financial analysis indicated that 98 percent of the 1,850 individual EE interventions were profitable (positive FIRR). Several enterprises implemented multiple interventions, and therefore the enterprises could achieve positive commercial returns despite the 30 specific interventions where returns were negative. Of the 100 revolving fund cases, 79 firms had positive IRR, with 39 having FIRR above 100 percent. Negative IRR cases were primarily because of larger loan size and lower benefits in first 5 years for which verified data was available, but in all cases the FIRR turns positive if returns over 7 years is considered. Overall, the average internal financial rate of return is 191%, and even if this average cannot be considered robust in view of variation of FIRR across a range of small to large investments by the MSMEs, it could be seen that the assumption of 20 percent internal rate of financial return was achieved in a huge majority of the project supported MSMEs. Annex 4 provides more details.

68. **Financial efficiency at project-level**: At appraisal it was implicit that: (a) the project is expected to reach an internal rate of financial return acceptable to the MSME industry, i.e., 20-25 percent, and (b) the project was seen to be ambitious given the experience of implementation of similar other projects in the Bank portfolio across regions, and achieving a very high internal rate of economic return would be challenging. Reconstruction of a

financial analysis using assumptions made at appraisal gave an internal rate of financial return of 23.6 percent, albeit not explicitly stated in the project appraisal document.

69. At Completion, the expenditure/cost of the project is fully known, recorded and verified. On the benefit side, the ICR uses only those benefits which were verified (not merely reported by MSMEs), such as savings due to implementation of EE interventions, GHG emission reductions and in a few cases, savings in water consumption and material consumption due to adoption of "lean manufacturing practices". Consequently, benefits reported by MSMEs yet to be verified were not included, and future benefits were considered only where evidence of such benefits already existed and were verified. In sum, the ICR attempted a conservative estimate of benefits.

70. At completion, the internal rate of financial return is 33.3 percent considering all expenditure from the grant and the leveraged financial resources together. This FIRR of 33.3 percent is calculated setting aside the benefits accrued from interest subvention of 2.5 percent (and a maximum of 3.5 percent) under the RF. If benefits of interest subvention were considered, the FIRR would be 36.7 percent. Considering a part of the expected financial returns/benefits were not included (see Annex 4 for details), the FIRR of 33.3 percent is a very conservative estimate, but comfortably exceeds the estimate at appraisal (20-25 percent as implicitly stated, or 23.6 percent as reconstructed from assumptions at appraisal).

71. **Economic efficiency**: At appraisal, but the implicit understanding included that the project was expected to reach an internal rate of economic return of at least 12 percent. Separately, it was assumed the project will catalyze an additional EE investment of USD90 million during the project period avoiding 7.3 million tons of CO_2e emissions over the lifetime of these interventions in all 30 clusters resulting in energy savings of approximately USD72 million. These assumptions were used to reconstruct an economic analysis, and a reconstructed internal rate of economic return based on these assumptions worked out to be 16.8 percent.

72. At completion, the benefits (conservatively estimated) exceeded the cost ratio by 35.8 times when only the GEF grant is considered, or 6.2 times when the grants and the leveraged financial resources were considered together. The internal rate of economic return at ICR was found to be 68.1 percent for the combination of expenditures from the grant and the leveraged financing from SIDBI, the commercial banks and self-investment by MSMEs. This is a robust but a conservative estimate of economic return considering that several potential economic benefits were ignored in this analysis at ICR (see Annex 4 for details). Even then this conservative estimate of internal rate of economic return far exceeds the assumptions at appraisal (12 percent as implicitly stated or 16.8 percent as reconstructed based on assumptions stated in the project appraisal document).

73. **Global Environment Benefit and Incremental Cost Analysis**: At project approval it was expected that with project intervention 4.8 million tons of CO_2e emissions will be avoided over the lifetimes of the EE investments with incremental EE investment of US$59 million across the 30 clusters: US$46 million as direct capital investments in 5 project clusters and indirect impact materializing into EE investments worth US$13 million in 25 BEE clusters. Therefore, cost effectiveness of GEF grant of US$11.3 million per incremental ton of CO_2e avoided was assessed to be US$2.84 due to direct investments in 5 project clusters and US$2.37 in all 30 clusters due to direct and indirect project impacts. Some of the assumptions were corrected at the time of the AF. At restructuring and AF thereon, unit values were adjusted to reflect as close to ground conditions. As a result, the project targeted $1.8 GEF$/incremental ton of CO_2e avoided at closure as a result of overall incremental ER due to both direct and indirect investments in 51 clusters (26 project and 25 BEE clusters); and $6.46 GEF$/incremental ton of CO_2e avoided in project clusters. The cost of GEF grant per incremental ton of CO_2e at closure with US$ 14.08 million disbursed was $0.87 for overall incremental ER and $5.17 incremental ER due to direct investments . Details are as per Annex 5.

Assessment of Efficiency and Rating

74. The design and the implementation of the project had been efficient, reflecting lessons learnt, and adapting to external environment continuously. With an internal rate of financial return of 33.3 percent (versus 23.6 percent envisaged at appraisal), an internal rate of economic return of 68.1 percent (compared to 12-16.8 percent envisaged at appraisal), and a huge majority of the MSMSEs exceeding the envisaged 20-30 percent internal rate of financial return at enterprise level, the overall efficiency of the project is **High.**

D. JUSTIFICATION OF OVERALL OUTCOME RATING

75. The overall Outcome Rating is Highly Satisfactory given that the ratings for Relevance of PDO, Efficacy and Efficiency have been assessed to be High with no shortcomings.

E. OTHER OUTCOMES AND IMPACTS (IF ANY)

76. The project contributed towards institutional strengthening, mobilizing private sector financing, and poverty reduction and shared prosperity. This was achieved through the creation of a viable market for EE/RECP interventions as well as the building the capacity of MSMEs, EE service providers, local vendors and FIs to continue to operate on such initiatives well beyond the project period. Such interventions have not only benefited the environment but increased profitability of MSMEs, helped in expansion plans, created additional business for EE service providers and FIs, and improved the working conditions in several MSMEs.

Gender

77. At completion, the project could show some progress in mainstreaming gender in the MSME sector and could list a few gender actions. The project supported general awareness about basic amenities such as provision of separate toilets for women; designated space for resting and personal hygiene; and focused campaigns on safe and respectable work space. Most of the entrepreneurs who participated in the awareness programs have implemented some of these measures. At least 22 enterprises have set higher goals of being attractive employers of women, partly driven by the need to access European markets, and have instituted social audits to verify respectful worker owner relationships. Women workers were particularly benefited by the RECP interventions: reduction in exposure to radiation heat, prevention of exposure to safety hazards in cutting and polishing of plastic products, elimination of exposure to fine dust and acid fumes in printed circuit boards, adoption of safe stitching methods and fabric dust free environments in garment industry and so on. The project had trained 216 women experts of FIs, as well as 45 women energy auditors who have entered the profession not traditionally known to employ women. The project has also supported 112 enterprises partly or fully owned by women. Despite these achievements, it must be noted that the project design did not include gender as concern, possibly because the women are not seen as mainstay participants in the energy-intensive MSME units/clusters. Gender actions and achievements had been incidental, not planned or targeted.

Sustainability and Scaling Up

78. The Project has resulted in the formation of a market-driven mechanism wherein end-to-end service providers have been created, demonstrated direct benefits of EE/RECP measures for MSMEs across twenty-two clusters have been shared, and inculcated an increased appetite among MSMEs to seek benefits that arise from EE/RECP measure including participating in the ZED rating system. These developments will ensure that the process of

adoption of EE and RECP measures by FEEMP will continue beyond the project period and the market size and the initiatives are expected to rise in the coming years.

79. The IBRD-funded ongoing $520m SME Financing and Development Project (P086518 and P102767) is focusing, among other objectives, on the expansion of innovative SME loan products, including possibly loans to smaller SMEs, and receivables financing; expansion of SME lending through other participating financial institutions, subject to demand; and exploration of the possibility of providing loans to promote investments in energy efficiency improvement technologies, subject to adequate demand from SME at the SIDBI for such funding. Lessons from FEEMP on possibilities of upscaling and mainstreaming its approaches will be useful to this ongoing operation, especially to meet its objective related to funding MSMEs towards energy efficiency initiatives.

80. SIDBI established a Green Climate and Sustainable Development Initiatives (GC&SDI) in 2018 to promote EE and cleaner production in the MSME sector through Green Financing as a regular part of its business activities. It has also been accredited by the Green Climate Fund as one of "National Implementing Entity" to provide finance for executing climate change projects in the developing countries like India. Moreover, based on the achievements made under FEEMP, it is developing a new initiative – Enhancing Energy Efficiency in MSMEs in India – towards EE interventions in 5000 MSMEs.

Institutional Strengthening

81. **The project strengthened and enabled SIDBI and BEE to work with an outcome-oriented approach, adopting a comprehensive and multi-pronged methodology, wherein the combination of a financial institution (SIDBI) and technical body (BEE), resulted in achieving outcomes, hitherto not gained by other EE interventions.** Both the institutions have used the capacity built during the project implementation period, as well as lessons learnt and tools developed, to expand their outreach and business in EE interventions. SIDBI established a Green Climate and Sustainable Development Initiatives in 2018 to promote EE and cleaner production in the MSME sector through Green Financing. It is also introduced the 4E solutions Program, developed under FEEMP, to MSMEs all across the country using its own sources of finance. SIDBI has also been accredited by the Green Climate Fund as one of "National Implementing Entity" to provide finance for executing climate change projects in the developing countries like India. Moreover, based on the achievements made under FEEMP, it is developing a new initiative – Enhancing Energy Efficiency in MSMEs in India – towards EE interventions in 5000 MSMEs.

82. **The project was instrumental in introducing concepts of Lean, Clean, Green and RE in SIDBI's lending philosophy**. Collaborative work and sustained efforts between the Bank, BEE and SIDBI successfully catalyzed and directed BEE and SIDBI's traditionally very strong but specialized EE work into innovative and crosscutting RECP initiatives. The project established proof of the concept demonstrating that the technical capacity building of MSMEs facilitated demand for RE including EE. The modus-operandi of the project included stakeholder capacity building and policy influence through evidence-based knowledge; mobilizing private sector finance through technical assistance for MSMEs, Banks and FIs; and promoting innovation and knowledge management for replicability and ease of implementation facilitated adoption of EE by MSMEs. SIDBI and many commercial banks recognized the significance of addressing EE in MSMEs, busting the myth that EE measures do not contribute towards bottom-line savings. SIDBI took corporate level business initiatives in integrating the EE practices into the loan appraisal process. Other commercial banks have developed programs to promote EE in MSMEs.

83. The initiatives taken under FEEMP are important mitigation strategies in combating climate change. The same was recognized in India's Nationally Determined Contributions[34] document highlighting successful initiatives taken in 500 MSMEs by SIDBI under the project as having significant impact on country's development outlook on Efficiency for its MSMEs.

84. The project's principle of promoting innovative technical solutions having ease of adoption, scalability and replication led to deployment of EE technology in the brick kiln industry. The zig-zag firing technology using natural draft influenced policy directives by the Central Pollution Control Board (CPCB), MoEFCC for adoption of technology across the country. India Energy Circles by Confederation of Indian Industries judged this as the best among 400 innovations. India's brick industry is the second largest with 13 percent of global production. Deployment of the new technology resulted in 20 percent fuel consumption reduction leading to annual ER of 0.36 million tCO_2 in the sector in India. Other significant benefits include improved brick quality, enhanced profit margins by $1 for every 75 bricks, reduced rejections thereby saving 36 million tons of topsoil, 10-fold reduction in suspended particulate matter (SPM), and improved working conditions by reducing fugitive[35] emissions.

85. The project streamlined the process of improving efficiencies at MSMEs by developing IGDPRs in place of regular detailed energy audit (including information on resource assessments as well) reports. The process was further improved by developing a mobile application for Resource Efficiency Assessment (REA), titled SIDBIREA. The free App reduced REA time at MSMEs by half while still maintaining the standards of being investor/financer friendly. The App was used during AF phase of the project. EE service providers, consultants of leaner cleaner production, MSMEs, and the banks/FIs found it useful as it resulted in simplyfing the process towards EE/RECP interventions for MSMEs and the EE/RECP consultants while also enabling FIs to simplify business procedures to decide on loan applications. The App also provides measurement and verification module post commissioning for baseline information and an implementation record for third-party evaluators. It also serves as a platform for knowledge exchange and standardization of EE/RECP interventions across various clusters by maintaining repositorty of audits undertaken.

86. A web-based portal (*http://indiasavesenergy.in/*) has been created as a knowledge product that is one-stop shop which provides comprehensive information as well as opportunities to representative MSME sectors for an interface with policy makers, funding and development agencies, R&D institutions and academia to promote EE. MoEFCC, GoI has recognized this effort in its Second Biennial Update Report to the UNFCC. The portal is being successfully used by non-participating MSMEs and other stakeholders for scaling and replication of FEEMP initiatives.

87. The project launched a web-based Energy Savings Assessment Tool (*http://eetool.istsl.in/#*) to create awareness regarding EE enabling various stakeholders to self-assess business opportunities – entrepreneurs can identify potential energy savings and related investments; bankers can check and verify MSME sector-based investment enhancement opportunities thereby helping them with their business portfolio development; and energy experts can quickly assess business opportunities in MSME of interest.

[34] *https://www4.unfccc.int/sites/submissions/INDC/Published percent20Documents/India/1/INDIA percent20INDC percent20TO percent20UNFCCC.pdf; page 18.*

[35] These are emissions not caught by a capture system; which are often due to equipment leaks, evaporative processes and windblown disturbances. Source*: https://ww2.arb.ca.gov/about/glossary?f percent5B0 percent5D=name percent3AF*

Mobilizing Private Sector Financing

88. As mentioned above, the Revolving Fund, titled as 'End-to-End Energy Efficiency (4E) Solutions' has promoted loans for a full range of Resource Efficiency improvement Loans. The 4E loan product is a blend of 25 percent interest free capital (with allowable ceiling limits) which encourages investments on Resource Efficiency. This product is accessed by the MSMEs for retrofitting the technologies, cleaner technologies, and financing for replacements with efficient equipment. While the 4E product was expected to leverage 1:4 investments from the market, the assessment during November 2018 has reflected effective investment leverage of 1:7 with overall Investments reaching about US$60 million. SIDBI will continue with the scheme beyond the project period, in compliance with Reserve Bank of India (RBI) guidelines. It is also noted that there are zero non-performing assets under RF; MSMEs are interested in the 4E product more because it provides the overall efficiency status of the enterprise; and though limited, some of the loan appraisal officers were keen to use 4E to enhance the overall loan viability as it reduces production costs and increases profitability, thus also reducing the loan payback period.

Poverty Reduction and Shared Prosperity

89. The project contributed significantly towards the twin goals of the Bank. Reduction in pollution, improvement in MSME product quality, improvement in Bank's asset quality, employment impacts from increased demand for EE goods and services, and improved working conditions of shop floor employees was observed and reported by stakeholders. These parameters are difficult to quantify but evident from increase participation from MSMEs, FIs and technology vendors.

Other Unintended Outcomes and Impacts

90. Potential to upscale Zero Defect Zero Effect (ZED) Program: GoI, through the Ministry of Micro Small and Medium Enterprises (MoMSME), is implementing ZED Program. ZED is one of its kind programs that encourages development of an eco-system for zero defect manufacturing among other objectives and surpasses other international certification programs. While the ZED provides the participating MSME a strong and robust framework for assessment of their status, it has not yet been able to create an ecosystem for their migration to improved rating and possible graduation to international level. Of the 12,000 enterprises assessed, 72 percent do not qualify for any rating and of the remaining, 83 percent have lowest 'bronze' rating. Further, there is no response from MSMEs to improve the rating since due to various reasons including support and lack of incentive for getting certified.

91. A pilot in five enterprises in Faridabad was undertaken to validate the extent of improvements in ratings that can be achieved and to also assess the potential impacts in MSME clusters which have so far not been covered under any such initiative. The pilot was implemented on FEEMP model. The study revealed that to enhance RECP, quality, productivity, competitiveness and strengthen environmental sustainability in Indian MSMEs, and thereby achieve transformative growth of the manufacturing sector and the country's economy, there is need to: (i) roll out intensive hand holding support for ZED program, assisting Indian MSMEs through national level marketing, awareness and capacity building efforts for responsible & value-added manufacturing, aligned with the vision of 'Make in India'; and (ii) increase demand for ZED based investments in MSMEs through capacity building to streamline ZED certification process in to MSME lending, public procurement and environmental regulations.

III. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

A. KEY FACTORS DURING PREPARATION

92. The key factors that affected project preparation are categorized as 'realistic objectives', 'appropriate selection of stakeholders', and 'adequacy of risk and mitigation measures identification' and are detailed below.

Realistic Objectives

93. Though the project objectives were focused and seemingly realistic, the absence of prior projects that focused on achieving outcomes and ERs made it a challenge to set targets and results. For FEEMP, the results had to be rationalized after several stakeholder consultations and reality checks. In the absence of any benchmarks at the time of project design, the agreed upon targets may be considered ambitious.

Appropriate Selection of Stakeholders

94. **Selection of Implementing agencies:** It was important to depart from the traditional "Energy Audit Reports/Recommendations" and get the audits translated to commercial and implementable proposals. This was possible only if an FI/Bank is involved to ensure field level implementation, converting energy audits to investment grade proposals. SIDBI's commitment to EE in the industrial sector and BEE's mandate to convert proposals into business propositions of MSMEs, lending institutions and technology providers made them good choices as implementing agencies. Overall project coordination was correctly vested with BEE under the programmatic framework for EE covering the World Bank, UNIDO and UNDP projects.

95. **Selection of MSMEs:** Absence of a baseline made initial selection of sectors and clusters challenging. NIC data was therefore used to study small scale industries across 41 sectors to identify energy intensive sectors. This led to developing criteria for selection of MSMEs which included threshold limits for minimum investment and minimum ERs.

Adequacy of Risk and Mitigation measures identification

96. The project was categorized as Low Risk and the original risk rating remained the same throughout the duration of the project. This was largely due to including risk mitigation measures as part of the project design and adoption of innovative measures as outlined earlier in the document.

97. **Stakeholder Capacity and Marketing:** Realizing the importance of bringing all the stakeholders to one platform through marketing efforts such as MSME outreach, business to business vendor interfacing, and training programs of FIs proved to be very useful. For example, vendor development and vendor awareness proved valuable in understanding the requirements of MSMEs and challenges to scale down and innovate EE technologies available hitherto to only large industries.

98. **Knowledge Proposition:** Recognizing the need for knowledge management was one of the important features of the project design. The TA under the project facilitated EE demand as well as built capacity for accessing commercial finance. Given the limited resources of the project, the impact would be possible only if replicability and scalability of the initiative was built in such as through knowledge sharing.

99. **Measurement & Verification:** The project's M&V mechanism was used to measure outcomes. It was important to demonstrate consolidated information on the benefits of the EE investments including energy-related, financial, and environmental co-benefits. Without M&V as part of the project, the MSMEs would have

had to engage a separate consultancy to undertake the exercise, chances of which would have been slim. It was also necessary to replicate the model of EE measures in MSMEs with FIs for which the M&V results acted as an important marketing tool.

100. **Ensuring MSME Buy-in:** Anticipating slow uptake from the MSMEs, designing the PLG as part of the project proved to be a very effective means to trigger the actual EE investments. It created a healthy competitive environment while giving an incentive to implement EE measures in time.

B. KEY FACTORS DURING IMPLEMENTATION

Factors subject to government and/or implementing entities control

101. **SIDBI Commitment:** To push the project concept, a higher level of organization commitment was required towards which SIDBI, as a development agency, took a bold initiative to establish the Energy Efficiency Center (EEC). The Center catered to the project implementation requirements and later also adopted the role of taking up corporate level business initiatives in integrating the EE practices into the loan appraisal process.

102. **Demonetization:** Country-wide demonetization by GoI in November 2016 adversely impacted the cash strapped MSMEs, especially the micro enterprises. This resulted a slowdown of EE implementation especially financed directly by MSMEs.

103. **Introduction of Goods and Services Tax:** Imposition of this tax by GoI in July 2017 further impacted uptake of energy conservation measures in micro enterprises. Since November 2016, majority investments were taken up by credit-worthy enterprises that were not vulnerable to market changes. The incidence of self-financed energy conservation measures reduced significantly.

104. **Low response from energy intensive clusters of Panipat and Kundli (Haryana) and regulatory issues in Tirunelveli**: The response to the project from the Panipat and Kundli clusters was muted due to the ban on using petcoke and furnace oil as well as limitations imposed on effluent discharge to common effluent treatment plant (CETP). This meant reduction in production and revenue for these enterprises. The finances of MSMEs were further impacted when they had to pay a higher than anticipated compensation level to farmers for land acquisition.

105. **Environmental Safeguards:** EE has been perceived as means to achieving regulatory compliance in Indian MSMEs. In many cases, the EE measures improved the environmental performance (for example, in lime cluster the air emissions have reduced due to EE measures) thereby complying with regulatory requirements. This practical business aspect was effectively utilized as one of the major incentives for expediting implementation progress.

Factors subject to World Bank Control

106. **Performance linked Grant:** PLG was originally designed for only 25 MSMEs as it was meant to demonstrate validity and benefits of EE measures to then-sceptic MSMEs. This had to be reworked to downsize the financial benefits to the participating MSMEs and enhance their credit access which proved to be useful in increasing the number of participating MSMEs.

107. **Leveraging Private Sector Finance for EE and resource efficiency:** Until 2014, implementation of EE measures was being self-financed by MSMEs. As a result, only small-sized investments were being implemented. To provide a boost to higher-valued investments, it was important to make finance from FIs attractive. Therefore, RF was

created to provide an interest subvention of up to 2.5 percent by blending grant funds (at 0 percent rate) and SIDBI's funds (at conventional lending rate). Measures that led to improved productivity were also financed in addition to measures that would directly lead to energy/resource efficiency. These measures may not necessarily yield similar magnitude of ERs as EE interventions but cumulatively yielded benefits to MSMEs. Therefore, the ratio of investments to ERs is higher (1: 1.4) in AF as compared to that during the parent phase for achieving targeted ERs.

108. **Introduction of RECP:** Project experience till 2014 underlined the fact that to achieve EE effectively, it is important to consider RECP measures as well. Energy consumption can be reduced by managing input resources and lean manufacturing. This in turn results in lowering consumption as well as wastage leading to cleaner production. Energy audits were adjusted to include RECP in IGDPRs.

109. **Readjustment of selection criteria of MSMEs:** The time of operationalizing AF coincided with many government decisions as described earlier. At the time of audit, many enterprises were using efficient fuel. As a result, the thresholds for minimum investment and ERs were revised for selection of MSMEs during the last two years of implementation of the project. This led to increased participation.

Factors outside the control of government and/or implementing agencies

110. **Coincidence of industry down-turn:** The idea for the project first came up around 2006 and was operationalized in April 2010. In between in FY09, the global financial crisis[36] hit hard all sectors of the economy, including in India. The MSME sector in India was hit particularly hard[37] and the focus of MSMEs was on survival rather than on activities such as EE which are perceived to be non-core component of business. The condition was further exacerbated by beliefs during the period of 2011-13 that cheap imports were putting several MSMEs in India out of business[38]. Thus, the industry downturn, both real and perceived, from project launch till about 2014 seriously affected performance during the initial years as the uptake for EE measures was limited. This is reflected in the project being assessed Mostly Unsatisfactory during 2013. The project responded by intensive discussions on the benefits of EE measures as well as on the usage of opportunity to improve EE beginning with the idle lying production capacity.

IV. BANK PERFORMANCE, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME

A. QUALITY OF MONITORING AND EVALUATION (M&E)

M&E Design

111. The indicators, both PDO and intermediate, were found to be well framed for an operation focused on reducing carbon footprint in MSMEs by improving energy efficiency. Though intermediate indicators were activity oriented, they contributed well towards the PDO indicators. The results framework could have been improved to address the following:

[36] *http://siteresources.worldbank.org/INTGLOMONREP2009/Resources/5924349-1239742507025/GMR09_ch01.pdf*
[37] *http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.890.9506&rep=rep1&type=pdf*
[38] *https://www.business-standard.com/article/sme/increased-import-of-chinese-goods-hurts-indian-msmes-113061701112_1.html*

(a) Indicators requiring better quantification of energy savings and reduction of polluting emissions of NOx, SOx and SPM as part of results framework would have improved reporting of the project. This is because energy savings is a direct indicator of type of fuel and efficiency of operations in an enterprise. Environmental parameters contribute towards reduction of air pollution and climate change.

(b) Due to limited availability of baseline data at the time of appraisal, targets for estimated and potential lifetime carbon ERs (PDO indicators 4 and 5) were determined based on small scale energy intensive industries using furnace oil, coal and thermal power generated electricity only.

(c) The project established the fact that energy efficiency cannot be maximized without accounting for RECP. The key indicators for RECP are reduction in input material and wastages. Therefore, inclusion of indicators related to resources like water, metals, chemicals, etc., at restructuring could have improved the M&E framework of the project on the impact of the project relating to the RECP agenda

M&E Implementation

112. The technical specialists in both BEE and SIDBI were responsible for monitoring, analyzing and reporting various activities of the project. The results framework was well framed to capture information right from the beginning of the project for various activities, including the potential of investments and ERs from IGDPRs, and activities related to building capacity and awareness of various stakeholders. Results of Measurement and Verification (M&V), reporting the results of the implemented EE measures like actual investments and ERs, and utilization of RF and private sector finance mobilized, were also captured regularly and reported as part of the progress monitoring in results framework. Overall, M&E implementation was well maintained.

M&E Utilization

113. The project provided M&E relevant to the results framework as evidenced in regular reporting in missions and aide memoires. M&E data was used for restructuring the project factoring the learnings of the project and market conditions. SIDBI needs to ensure that the data remains relevant for future use.

Justification of Overall Rating of Quality of M&E

114. Though there was scope of improving the results framework to factor ER targets and RECP measures, the overall design, implementation and utilization of M&E was found to be targeted towards achieving the PDO and in agreement with the Theory of Change. The overall rating is **Substantial.**

B. ENVIRONMENTAL, SOCIAL, AND FIDUCIARY COMPLIANCE

Environmental Safeguards

115. The project was classified as Environment Category B at time of appraisal, according to World Bank Environmental and Social Safeguard review procedures. The Project triggered World Bank's OP/BP 4.01 on Environmental Assessment (EA). No social safeguard policies were triggered.

116. The risks envisaged were well addressed systematically since they were factored in the project implementation cycle from the beginning. As part of the capacity building, efforts were made to sensitize the SMEs and energy auditors on energy and environment co-benefits of the project. Further, efforts were made to

sensitize FIs to integrate environmental compliance as part of SME loan processing and appraisal. Such efforts were drawn from SIDBI's loan appraisal mechanism of using Environmental and Social Risk Management Framework (ESMF) for Bank funded project "P102767 – SME Financing and Development – Additional Financing".

117. Facilitation of EE investments led to environmental benefits with reduction in fossil fuel consumption, NOx, Sox and SPM. Walkthrough audits (as part of outreach MSMEs) and detailed energy audits (a) reviewed the level of regulatory compliance with reference to conditions of "Consent to Operate"; (b) followed requirements under Indian Legistalation; and (b) identified environmental measures, including environmental health and safety (EHS) aspects that are complimentary to EE improvements. Essential EHS measures were made part of EE investments. All the above resulted in improved working conditions in MSMEs as well as avoiding disasters like fires due to poor fuel storage facility. Inclusion of RECP further helped in reduction of wastages and addressing concerns of disposal of waste.

118. The impacts of safeguards compliance are embedded in the web-portal (*http://indiasavesenergy.in/*) developed as part of knowledge management product. Overall, the safeguards performance of the project is 'Highly Satisfactory'

Financial Management

119. The financial management performance has been satisfactory throughout the entire duration of the project and there were no significant FM issues encountered during the project implementation. This was mainly because of:

(a) simplified financial management arrangements;
(b) use of government's mainstream treasury systems by BEE;
(c) sustained availability of experienced and qualified accounting staff in the BEE and SIDBI; and
(d) effective oversight and control by the both the agencies.

120. The BEE & SIDBI were regular in the submission of IUFR, expenditure claims, other financial reports as and when required and audit reports to the Bank. These aspects resulted in submission of external audit reports to the Bank before the due date. Overall the project was timely in submission of quarterly IUFRs, Disbursement claims, submission of Internal and external audit reports to the bank.

121. Grant disbursements were very slow during initial period and following the restructuring with additional financing, the disbursements marginally increased over a period. By end of June 2019, the project had disbursed US$ 14.08 million (85 percent) (SIDBI and BEE disbursed US$11.97 million and US$2.11 million respectively) out of a revised grant amount of US$16.49 million. A significant part of the savings is due to currency fluctuation. Overall financial management rating is 'Satisfactory'.

Procurement

122. The bidding and selection process were conducted in a fair and transparent manner without any significant complaints on the procurement cycle management. In BEE, the last phase experienced some procurement delays due to frequent change of procurement expert. Contracts Management potential was an issue in BEE that contributed time overruns in several cases. Delay in making payment was evident in several PPRs. However, these issues were not observed in case of SIDBI managed activities which comprised major part of the project.

Governance and Accountability Action Plan (GAAP)

123. Project implementation successfully covered the associated risks – both institutional and managing multi-stakeholder coordination. BEE and SIDBI honored the memorandum of understanding (MOU) signed between them whereby BEE will have overall supervision responsibility as well as communicating with GEF since it manages India's Programmatic Framework for EE for GEF. SIDBI was responsible for implementation of cluster-level activities since it provides national level financing for SMEs and has been implementing various Bank supported projects.

124. Both the implementing agencies (IAs), BEE and SIDBI, maintained fair and transparent contract management ethics and no complaints from any stakeholder was received in the entire duration of the project. The project had a strong criterion for selection of MSMEs for EE investments which was ensured to be followed by energy auditing consultancies by BEE and SIDBI. Performance based contract of these consultancies helped in maintaining the momentum of implementation. As mentioned above, financial management and M&E was found to be complied with due diligence.

125. No impacts due to procurement delays or limited competition were reported except in the last two years of implementation for the activities managed by BEE. This is attributed to change in management of BEE which was responsible for decision making. Despite fully functioning PMU, low supervision by BEE management led to procurement delays and non-procurement of certain activities including Impact Evaluation of project under AF. BEE also did not undertake the final impact evaluation study after the project closed.

C. BANK PERFORMANCE

Quality at Entry

126. The project was designed well keeping in mind the strategic relevance of addressing EE in MSMEs considering MSMEs constitute 80 percent of country's industrial sector and has 33-75 percent of industrial energy requirement. Though technical assistance was provided by the project, the project design is an innovative platform for furthering the cause of Energy/Resource Efficiency technical assessment to reap the benefits of resources efficiency through awareness and action in terms of financial investments has been influenced by the recognition that the stakeholder perspectives are equally or more important for technology choices and technical context. These have been addressed through various activities covered in project component and captured through results framework as discussed in preceding sections. The project team designed the project in consultation with two apex institutions in the sector – BEE and SIDBI to cover the risks associated with working with MSMEs.

Quality of Supervision

127. Bank supervision included close coordination with both BEE and SIDBI. This is evident from the very beginning of the project which took time to mobilize due to industry slowdown at the time of effectiveness and continued two years thereon. Close collaboration with IAs was evident with the support on fiduciary and procurement aspects that was required. IAs were have been candid in bringing to attention of the Bank the issues faced by them from time-to-time faced by them. The bank took due cognizance of the same and helped adapt the project to the concerns from the field from participating in the marketing outreach efforts to provide thrust to investments to reconditioning the selection criteria of MSMEs.

128. Missions included field visits and discussions with counterparts. Aide Memoirs documented the findings of the missions. The decisions taken to adapt to changing socio-economic-political scenarios were well communicated and documented by the Bank to the IAs.

129. The team focused on building partnerships with the MSME stakeholders - such as, entrepreneurs, MSME vendors, industry associations, technical specialists (including floor shop supervisors), workers, bankers and financial institutions (especially loan officers), regulators, IT experts, etc. Collective interactions led to innovation and solutions.

130. Restructuring of the project was a proactive way of realigning the project. Industrial slowdown impacted implementation progress in the first two years of the project resulting in savings of US$3.36 million. These funds were reallocated and utilized effectively once the project was restructured.

131. To ensure sustainability of good practices and tools developed under the project beyond the project period, RF has been formally institutionalized with SIDBI. Repayments from enterprises is replenishing the RF to further lend to qualifying MSMEs and there is no NPA. RE/EE tools have been made available in public domain. Further, the World Bank explored opportunities to scale up GoI's Zero Effect Zero Defect (ZED) program using FEEMP principles. Due to its implementation structure and other policy factors, ZED has not received much participation from MSMEs. The World Bank also explored the potential of continuing efforts in MSMEs in Rajasthan. The latter two resulted in feasibility studies which were financed under the project.

Justification of Overall Rating of Bank Performance

132. The overall Bank performance is rated Highly Satisfactory. Since preparation the Team gave due consideration to role of stakeholders, focused on translating energy audits into business proposal for all stakeholders, worked in close coordination with IAs and realigned the project to changes in macro-economic conditions of the country.

D. RISK TO DEVELOPMENT OUTCOME

133. The risk to these Development Outcomes is Low to Moderate as adequate capacity and orientation has been built among the MSME entrepreneurs in the targeted clusters; a pool of local EE experts and equipment vendors has been developed; marked-based mechanisms for further EE interventions has been created; and both the implementing agencies, SIDBI and BEE, have internalized the approaches and models for EE and RECP interventions developed by the project in their current and future workplans. Further, there is a current pipeline of INR 16,970 million worth of EE investments translating into 13.34 million tCO_2e lifetime (potential and replicable) ERs beyond the project period.

134. The PDO focused on two aspects –increasing demand towards EE investments in MSMEs and building their capacity to access commercial finance. Since both SIDBI and BEE also act as intermediaries for EE interventions supported by other donor agencies, the learnings from FEEMP will extend to the EE-related work of several bilateral and multilateral partners in the MSME sector in India. Thus, the Development Outcomes will also impact EE interventions beyond the project period in MSME clusters, other than those targeted by the project.

135. The key risks to development outcomes arise from factors outside the project such as any future major tax or trade regime disruptions significantly impacting the MSME sector in India or if there is a global economic downturn in the near future. However, the risk arising from such factors is much lower than at the

start of the project as the benefits of EE and RECP interventions to increased competitiveness and higher profits have been validated and accepted in the targeted MSME clusters.

V. LESSONS AND RECOMMENDATIONS

136. Lesson 1: **Given a well designed and implemented project, it is possible to show that "good environment is good for business too"**. The project was able to build a viable market for EE and RECP interventions wherein all key stakeholders (MSMEs, FIs, EE service providers, equipment vendors) benefited through increased profitability and business opportunities as well as contributed towards ERs and reduced resource consumption. MSMEs were ready to invest on their own or seek funding from FIs other than SIDBI once they were convinced of the benefits of EE and/or RECP measures as well and the ability of end-to-end service provision to realize these benefits.

137. Lesson 2: Key barriers to MSMEs implementing EE and RECP measures are lack of information and availability of appropriate end-to-end service providers for MSMEs. A large part of the project's success lies in providing verifiable demonstrations of EE and RECP interventions that were not only directly relevant and beneficial to a particular sector of MSMEs but could be implemented with support from project-trained and locally available service providers at a reasonable cost. It may be mentioned that while ESCOs provided such services, ESCO services are restrictive to EE measures, and they came at a much higher cost that was not affordable by a majority of MSMEs.

138. Lesson 3: Government EE schemes including GoI's Zero Defect Zero Effect (ZED) Program need to shift focus simply from providing financial subsidies and rating systems to provision of technical assistance and demonstrative pilots on EE and RECP. Most government schemes fail to consider low capacity and low-risk taking ability of MSMEs. To achieve scale and wider impact, these schemes need to shift focus to a mix of technical assistance (innovative solutions that can be implemented by locally available skilled workforce) and business-friendly financial solutions. Further, to help companies move to higher ZED ratings, a similar approach may be adopted which also results in quantifiable benefits to a business it as moves up the ZED rating chain. These benefits could be bottom-line savings, increased access to government procurement systems (for example, GoI has agreed that all procurement for Indian Railways Public Sector Undertaking will be done only through ZED certified industries), and improved growth prospects of the company over medium to long term. FEEMP demonstrated successful implementation of this modified-ZED approach.

139. Lesson 4: The model of partnership between an FI (such as SIDBI) and a technical organization (such as BEE) provides an effective environment for larger interventions in the MSMEs across the country and in multiple sectors. As the project has shown, to achieve a high level of success in EE interventions, FIs and technical service providers have to work jointly based on the needs, aspirations and constraints of MSMEs. Most MSMEs lack the capacity to negotiate with EE service providers on their own as well as FIs are unable to effectively assess EE and RECP proposals without support from technical professionals.

140. Lesson 5: **Financial incentives along with ensuring financial stake of MSMEs at the initial stage can spur an effective EE market.** As the project began to implement a strategy of graded payment system to service providers based on successful implementation of each of the multiple stages of the EE or RECP interventions, the translation rate from the identification stage to demonstrated successful implementation soared. Another factor that contributed to the success including weeding out of the non-serious MSMEs was the upfront fee payment of INR 30,000 for the Walkthrough Audit and submitting investment grade detailed project report (IGDPR). Thus,

the more financial stake an MSME has in implementing the EE/RECP measures, the more its commitment to go through the whole cycle in a meaningful manner (conversion increased from the earlier rate of 25 percent to nearly 100 percent). Moreover, initial low-cost improvements gave the maximum IRR, mostly greater than 100 percent. Thus, it is important to begin with such interventions to not only showcase early and high level of success, but it also results in confidence building among MSME owners and FI managers of the technical validity and benefits of EE / RECP solutions. For each investment under RF, nearly 9 additional MSME came in without any incentive. Thus, even a small well-designed incentive can trigger a very large change.

141. Lesson 6: **Intermediaries such as Industry Associations as well as local social leaders can play a key role in building trust among MSMEs that need or seek EE/RECP solutions and the service providers**. In all the clusters where the Project was implemented, the local Industry Associations played a key facilitating role in creating trust between the initially-sceptic MSMEs and the project team (World Bank, SIDBI, BEE). They acted as key interlocuters helping the project team understand the nature of the problems and barriers, identification of first-movers, and communicating the success of pilot projects to their member MSMEs. In Punjab, engaging the religious leaders for advocacy enhanced success rates as they saw such interventions benefiting the society as a whole.

142. Lesson 7: RECP may be a more effective approach than the focus only on EE. Project focusing on RECP as whole have better uptake and results compared to EE alone, especially for progressive and financially strong MSMEs. Due to limited resources and capacity, MSMEs prefer single consultant for providing multiple solutions. When an MSME gets the benefits of both EE and RECP interventions from one technical assistance transaction, they are more likely to think long-term and invest in achieving greater benefits for itself while also helping the environment through lesser consumption of resources and higher ERs. Looking forward, the ESCOs might need increase their span of services to RESCOs.

143. Lesson 8: **Future such projects may seek to initially intervene in more clusters than planned for as MSMEs are highly vulnerable to market and regulatory changes.** In 4 out of the selected 26 clusters, no EE investments could be made as MSMEs were focusing on survival rather than growth or improved business practices. This was largely due to unanticipated market and regulatory changes. However, the capacity and awareness generated through the project has resulted in encouraged MSMEs not initially part of the project, to start investing in RECP measures – both in 26 project clusters and beyond. SIDBI received requests from 224 MSMEs across the country for assistance under RF.

ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS

A. RESULTS INDICATORS

A.1 PDO Indicators

Objective/Outcome: Increase demand for energy efficiency investments in target MSME clusters

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of Investment Grade Detailed Project Reports Prepared (Nos.)	Number	0.00 30-Apr-2010	500.00 30-Apr-2010	730.00 12-Oct-2016	1257.00 04-May-2019

Comments (achievements against targets):
By completion of project, 1257 MSMEs had committed to implement energy efficiency measures as identified in investment grade detailed project reports (IGDPRs) prepared as part of detailed energy audit. The response was 72% better than what was envisaged at AF and 150% better than original target.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Estimated Replicable EE Investments (INR Million)	Text	0.00 30-Apr-2010	611 30-Apr-2019	3900 12-Oct-2016	16971 04-May-2019

Comments (achievements against targets):
The potential of MSMEs implementing EE and RECP measures are to the tune of INR 16,971 million, which is four times the envisaged target of INR 3,900 million at AF and 2677% better than original target of INR 611 million. The estimate for potential investments has been done based on the impact evaluation reports of four clusters. It includes measures that have not been implemented by MSMEs as per the recommendations of IGDPRs in 16 clusters where project intervened, and conservatively includes the potential in 25 clusters where project did not have any presence in addition to MSMEs in 16 clusters.

Objective/Outcome: Build MSME capacity to access commercial finance

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Aggregate Value of Direct Energy Efficiency Investments (INR Million)	Text	0 30-Apr-2010	2148 30-Apr-2010	1660 12-Oct-2016	3322 04-May-2019

Comments (achievements against targets):
Project interventions helped MSMEs get access to finance from commercial banks by developing customized financial solutions to promote EE/RECP and increase appetite of MSMEs to implement high-cost investments. This resulted in realized investments towards EE/RECP measures to the tune of INR 3,322 million. This was 100% more than the envisaged target at AF but 50% more than original target of INR 2148 million.

Objective/Outcome: Stabilize atmospheric GHG concentrations by increasing EE investments and resulting energy savings

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion

Carbon reductions	Text	0 30-Apr-2010	4.6 million tons of lifetime carbon ERs 30-Apr-2010	9.15 million tons of lifetime carbon ERs 12-Oct-2016	16.06 million tons of lifetime carbon ERs 04-May-2019
Estimated Potential and Replicable Carbon Reductions	Text	0	3.6	6.6 million tons of lifetime carbon ERs	13.34 million tons of lifetime carbon ERs

Comments (achievements against targets):
Project led to total 16.06 million tons of carbon emission reduction (tCO2), 75 percent more the anticipated target at AF and nearly four times that of original target. 16.06 million tons of ERs includes cumulative lifetime ERs through direct investments of INR 3,322 million as well as 13.24 million tons of potential cumulative lifetime carbon ERs that would result from estimated replicable investments of INR 16,971 million.

A.2 Intermediate Results Indicators

Component: Component 1: Activities to Build Capacity and Awareness for energy efficiency

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Energy Efficiency Outreach	Number	0.00 30-Apr-2010	2800.00 30-Apr-2010		5226.00 04-May-2019
MSME Enterprenuers -	Number	0.00	400.00	1800.00	9167.00

Outreach		30-Apr-2010	30-Apr-2010		04-May-2019
Energy Auditors Training	Number	0.00 30-Apr-2010	150.00 30-Apr-2010	700.00 12-Oct-2016	750.00 04-May-2019
FI Sector personnel training	Number	0.00 30-Apr-2010	1000.00 30-Apr-2010		1120.00 04-May-2019

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of units implemented ISO 50001 (No.)	Number	0.00 30-Apr-2010	0.00 30-Apr-2010	40.00 12-Oct-2016	48.00 04-May-2019

Comments (achievements against targets):
Project achieved target of 48 MSMEs participating and implementing to get ISO 50001.

Component: Program Knowledge Management

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised	Actual Achieved at

				Target	Completion
Knowledge Products Generated and Disseminated	Text	0 30-Apr-2010	no specific target 30-Apr-2010		Several Knowledge Products Generated 04-May-2019
Energy Efficiency Demonstration Videos	Number	0.00	0.00	6.00	11.00
B 2 B Vendor Interfacing	Number	0.00	0.00	19.00	14.00
Energy Conservation Awards	Number	0.00	0.00	140.00	534.00
On job EE Training	Number	0.00	0.00	150.00	133.00

Comments (achievements against targets):

A. KEY OUTPUTS BY COMPONENT

Objective/Outcome 1: Increase demand for energy efficiency investments in target micro, small and medium enterprise clusters	
Outcome Indicators	1. Number of IGDPRs prepared (Target: 730) 2. Aggregate value of direct EEIs from the project (Target: INR 1,660 million) 3. Estimated replicable EEIs (Target: INR 3,900 million)
Intermediate Results Indicators	1. Number of Energy Efficiency Outreach (Target: 2,800) 2. Number of MSMEs reached through outreach/marketing (Target: 1,800) 3. Number of energy auditors trained (Target: 700) 4. EE Knowledge Products generated and disseminated (Target: No specific target) 5. EE Demonstration videos(Target: 6) 6. B2B Vendor Interfacing (Target: 19)
Key Outputs by Component (linked to the achievement of the Objective/Outcome 1)	Component 1: 1. 5,226 EE reached out 2. More than 9,000 entrepreneurs reached out 3. 750 energy auditors trained 4. 48 MSMEs got certified for ISO 50001 Component 2: 5. Project's TA support extended to 1,257 MSMEs of which 1,067 undertook implementation of EE measures. 6. More than 90 percent of allocated USD 585,000 for PLG disbursed Component 3: 7. several knowledge products developed including http://indiasavesenergy.in, SIDBIREA and *http://eetool.istsl.in* 8. 11 EE demonstration videos developed 9. 14 B2B technology workshops conducted

	10. 534 EC awards given 11. 133 shop floor employees trained
Objective/Outcome 2: build capacity of MSMEs in target clusters to access commercial finance	
Outcome Indicators	1. Number of IGDPRs prepared (Target: 730) 2. Aggregate value of direct EEIs from the project (Target: INR 1,660 million) 3. Estimated replicable EEIs (Target: INR 3,900 million)
Intermediate Results Indicators	1. Number of Energy Efficiency Outreach (Target: 2,800) 2. Number of MSME units reached through outreach/marketing (Target: 1,800) 3. Number of energy auditors trained (Target: 700) 4. Number of FI personnel trained (Target: 1,000) 5. B2B Vendor Interfacing (Target: 19)
Key Outputs by Component (linked to the achievement of the Objective/Outcome 2)	Component 1: 1. 5,226 EE reached out 2. More than 9,000 entrepreneurs reached out 3. 750 energy auditors trained 4. 1,120 FI personnel trained Component 2: 5. More than USD 5 million disbursed in RF. 6. RF amount leverage INR 1,386.5 million in private lending from SIDBI (4E scheme) in 108 MSMEs. 7. Total INR 2,964 million commercial finance leveraged by project. Component 3: 8. 14 B2B technology workshops conducted

Objective/Outcome 3: GEO - Stabilizing atmospheric concentrations of greenhouse gases (GHG) through an increase in EE investments and resulting energy savings	
Outcome Indicators	1. Number of IGDPRs prepared (Target: 730) 2. Aggregate value of direct EEIs from the project (Target: INR 1,660 million) 3. Estimated replicable EEIs (Target: INR 3,900 million) 4. Cumulative and estimated lifetime Carbon ERs through direct investments (Target: 2.55 million tons of CO_2) 5. Potential cumulative lifetime Carbon ERs (6.60 million tons of CO_2)
Intermediate Results Indicators	1. Project will support EE investments which will reduce global emissions of CO_2 by 7 million tons over the lifetimes of equipment installed
Key Outputs by Component (linked to the achievement of the Objective/Outcome 2)	1. With INR 3322 million direct EE investments, 2.72 million tCO_2 lifetime carbon ERs were achieved. 2. 13.34 million tCO_2 lifetime ERs are envisaged if pipeline of INR 16,970 million worth of EE investments is implemented.

ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION

A. TASK TEAM MEMBERS

Name	Role
Preparation	
Supervision/ICR	
Sita Ramakrishna Addepalli	Task Team Leader(s)
Atin Kumar Rastogi	Procurement Specialist(s)
Anantha Krishna Karur	Financial Management Specialist
Sameer Akbar	Team Member
Sandhya Krishnan	Team Member
Suiko Yoshijima	Environmental Specialist
Varun Singh	Social Specialist
Charu Jain	Environmental Specialist

A. STAFF TIME AND COST

Stage of Project Cycle	Staff Time and Cost	
	No. of staff weeks	US$ (including travel and consultant costs)
Preparation		
FY06	1.650	9,097.48
FY07	9.373	69,281.39
FY08	7.050	50,072.39
FY09	15.078	152,928.81
FY10	24.064	184,299.18
FY11	0	34,841.19
Total	**57.22**	**500,520.44**
Supervision/ICR		

FY10	0	0.00
FY11	11.850	21,868.58
FY12	18.815	31,298.07
FY13	11.715	27,024.29
FY14	16.100	49,711.99
FY15	18.875	42,166.67
FY16	9.195	35,576.99
FY17	12.450	61,282.33
FY18	10.000	34,518.80
FY19	11.150	91,489.18
FY20	10.137	35,152.02
Total	**130.29**	**430,088.92**

ANNEX 3. PROJECT COST BY COMPONENT

Components	Amount at Approval (US$M)	Actual at Project Closing (US$M)	Percentage of Approval (US$M)
Component 1: Activities to Build Capacity and Awareness for energy efficiency	3,909,410.00	2,909,410.00	74.42
Component 2: Activities to Increase Investment in EE	5,687,896.00	10,917,896.00	191.95
Component 3: Program Knowledge Management:	1,000,000.00	1,625,000.00	162.50
Component 4: Project Management	522,694.00	1,037,694.00	198.50
Total	**11,300,000.00**	**16,490,000.00**	**145.93**

With total disbursement of US$ 14.08 million, 124.6 percent of originally approved amount was utilized.

ANNEX 4. EFFICIENCY ANALYSIS

Overview

1. The Project involved (a) building capacity and awareness for EE across stakeholders; (b) direct interventions at MSME level to increase investments in EE facilitating active involvement of service providers and FIs; and (c) develop and disseminate program knowledge management tools. The project was designed to address the practical concerns plaguing adoption and expansion of EE in MSMEs. The Project encouraged EE investments from local commercial banks and MSMEs, and deployed performance linked grants (PLGs) for early adopters of EE technologies. The latter encouraged adoption and replication of EE measures as well as competition.

2. The project was also designed to be part of the larger MSME EE program. It aimed at bridging gap between techno-economic and financial-institutional aspects related to EE investments as well as scaling and replicating EE measures to help enterprises increase productivity, improve revenues and potentially help graduate some micro enterprises to the next level. Focus was also on knowledge creation and dissemination. These aspects were not easy to quantify to be able to include any analysis of efficiency, even if it is important to recognize the importance of institutional models and knowledge that were created, and information disseminated.

Efficiency Analysis at Appraisal

3. **Economic Analysis at Appraisal**: A formal economic analysis for the project was not attempted at appraisal. Under a business-as-usual scenario (based on a study of a sample MSMEs in 2008), the total investments were assessed to be US$31 million in 30 clusters resulting in cumulative emission reduction of 2.5 million tons of CO_2e was assessed in these clusters over an average economic lifetime of 10 years of EE interventions. It was assumed that the savings accrued from avoidance of GHG emissions itself will be enough to make the overall project benefits to exceed cost, even if the benefits generated by other capacity-building activities were to be low. At appraisal, there was no specific discussion regarding the internal rate of economic return of the project as a whole, but it was implicit that: (a) the project is expected to reach an internal rate of economic return of 12 percent, and (b) the project was seen to be ambitious given the experience of implementation of similar other projects in the World Bank portfolio across regions, and achieving a very high internal rate of economic return would be challenging.

4. Assumptions at appraisal included that the direct support provided under the project would increase penetration rate to 40 percent (from the baseline of 15 percent) in the 5 project clusters thereby increasing the number of enterprises investing in energy-efficiency interventions to 500. This was estimated to result in total EE investments worth US$46 million with the participating MSMEs were expected to invest in comprehensive and capital-intensive EE measures (at average enterprise-level cost of US$ 92,000). It was also assumed that penetration rate in the 25 clusters where the BEE would support capacity building would increase from the baseline of 15 percent to 25 percent. Separately, it was assumed the project will catalyze an additional EE investment of US$90 million during the project period avoiding 7.3 million tons of CO_2e emissions over the lifetime of these interventions in all 30 clusters resulting in energy savings of approximately US$72 million. These assumptions could be used to reconstruct an economic analysis, which was attempted at the time of the ICR. A reconstructed internal rate of economic return based on these assumptions worked out to be 16.8 percent.

5. **Financial Analysis at Appraisal**: No formal financial analysis was attempted at appraisal, but the justification and rational for financial viability was discussed in detail. An analysis of financial return was done using data from energy-efficiency interventions until 2008. The sample was limited and covered (a) 260 enterprises from the 3,800 enterprises from the 5 clusters where the project was planned to be implemented, and 650 or 15 percent of the

4,362 enterprises in 25 clusters where capacity building was to be undertaken by the BEE. It was assumed that each individual enterprise supported by the project would invest an average of US$30,000 for energy-efficiency. Given the baseline situation of the sample enterprises including the baseline of fuel used, price of energy inputs, average savings (in kWh and carbon equivalent) resulting from enterprise-wide implementation of energy-efficiency interventions, annual energy savings of US$27 million were estimated, compared to the estimated investment of US$31 million (comprising of US$9 million the planned 5 project clusters and the 25 clusters where capacity building support was to be undertaken by the BEE). Although at appraisal, there was no specific discussion regarding the internal rate of financial return of the project as a whole, it was implicit that: (a) the project is expected to reach an internal rate of financial return acceptable to the MSME industry[39], and (b) the project was seen to be ambitious given the experience of implementation of similar other projects in the World Bank portfolio across regions, and achieving a very high internal rate of economic return would be challenging. Reconstruction of a financial analysis using assumptions made at appraisal (that a grant of US$31 million to mobilize another USD90 million during the project duration is expected to result in US$27 million in annual financial return two years after the EE interventions were implemented) gave an internal rate of financial return (FIRR) of 23.6 percent, albeit not explicitly stated in the project appraisal document.

6. **Financial Return at Enterprise-level at Appraisal**: At appraisal, it was asserted, based on experience of energy-efficiency investments in small and medium enterprises (as opposed to MSMEs) routinely achieve FIRR of 30 percent and above, with simple payback period ranging from 2 months for low cost investments to 2 years or more for larger capital-intensive interventions. This initial assessment was based on: (a) market assessment of grant-funded pilots implemented for small and medium enterprises in four clusters of Kolhapur, Pune, Faridabad and Ankaleshwar; (b) results reported in World Bank supervision reports for projects implemented by the Indian Rural Energy Development Authority and other financial institutions; and (a) a three-country energy efficiency project report.

7. It was implicit that results available from larger enterprise-level energy-efficiency interventions in small and medium enterprises could not be directly applied to MSMEs, but it was explicit that savings resulting from energy-efficient interventions was considered sufficient to make individual MSME-level intervention financially viable (i.e., above 20 percent even if below 30 percent as in the case of small and medium enterprises studies at appraisal) This was consistent with the implicit assumption of FIRR for the project as a whole (i.e., 23.6 percent as reconstructed).

Efficiency Analysis at ICR

8. As reviewed at ICR, the project was implemented as envisaged during appraisal but with expanded targets and allocation. Notable enhancement came about from: (a) a combined extension from two restricting such that the project closing date was extended from December 31, 2014 to May 4, 2019, (b) reallocation of accrued savings of US$3.365 million across project components of which US$3 million went towards creation and piloting a revolving fund (RF); (c) geographical and numerical expansion of outreach of EE measures to more enterprises; and (d) an additional financing of US$5.19 million (without changing nature of activities) entailing enlarged targets which included an expectation of mobilizing an additional US$25 million from market.

9. The expenditure/cost of the project is fully known at ICR. The cost of the project included the (a) GEF grant, and (b) the self-financing from the MSMEs which included where MSMEs implemented interventions with their own capital, loan repayments where the MSMEs services loan taken under the project from SIDBI and other commercial banks. The capacity building and awareness campaigns, the energy audits, the development of dissemination of knowledge outputs and the program supervision costs were financed by the grant. Each of these expenditures were

[39] Usual internal rate of financial return expected by an enterprise seeking commercial bank loan in India ranges between 20 to 25 percent.

carefully recorded and verified. The exceptions are the loan management costs of the commercial banks where MSMEs applied and received loans, and a portion of the program management costs that were internalized by SIDBI and BEE. These expenditures or costs were not monitored, but were expectedly small, and were not included in the efficiency analysis at ICR.

10. On the benefit side, in addition to the savings due to implementation of EE interventions (in fuel consumption, reduction in energy bills) which were carefully monitored and verified at MSME level, GHG emission reductions were also monitored and verified. Additionally, benefits accruing from savings in water consumption and material consumption due to adoption of "lean manufacturing practices" were monitored for some of the MSMEs. The ICR uses only those benefits which were verified (not merely reported by MSMEs). Consequently, benefits reported by MSMEs yet to be verified were not included, as described in detail in the paragraphs below. Future benefits were considered at the ICR only for sub-streams where evidence of such benefits already existed and were verified.

11. Potential future benefits from (a) potential GHG emission reduction, (b) potential resource savings including fuel/energy, raw materials and water if all IGDPRs were to be implemented could also be estimated as substantial data existed. However, as described in the paragraphs below, these were not used for efficiency analysis as there remains some uncertainty in terms of expected schedule and comprehensiveness of implementation of the recommendations of the IGDPRs.

12. Benefits included at ICR analysis of efficiency were the items of benefits considered at appraisal. Although the implementing agencies had created database that could lead to estimation of several other items of benefits including benefits that could accrue in future, those were not included. The ICR attempted a conservative estimate of benefits.

13. The ICR efficiency analysis was done using INR as the currency for expenditure and benefits. This was to avoid impact of the wide variation of currency exchange rates during the project implementation period as well as at any interval during this implementation period.

Assumptions

14. Assumptions for financial analysis at intervention and enterprise/firm level: the following assumptions were made for undertaking financial analysis:

a. All financial (and economic analysis) was done using INR as a currency. This negates any influence of currency exchange-rate variation on the financial analysis. Note that the INR depreciated very substantially against the US$ during the project implementation period (from 47.7:1 in 2010 to about 70:1 during 2018-19).

b. For enterprises availing RF, they were undertaking multiple initiatives and spending more than the sanctioned loan amount. In such a scenario, initiatives where bigger investments were done are taken to have been financed by the loan. The remaining smaller of the initiatives were deemed to have been financed from other sources. The treatment of such initiatives would be same as non-RF cases with an opportunity cost assumed at 9 percent;

c. For the enterprises that did not avail RF, it was assumed that they raised loans from some vendor (commercial bank Loan) or financed it from their own funds (self-financed). The cost of funds is taken at 9 percent, i.e., the rate at which RF cases availed bank loans;

d. The benefits started during the first year after the interventions were implemented and continued for a maximum of 5 years. Benefits were received at the beginning of each year for non-RF cases. For the enterprises

availing RF, the benefits started during the first year after the interventions were implemented and continued for the term of the loan and are received at the beginning of each year.

e. Performance-linked grants (PLG) as an incentive, applicable only for non-RF cases, were paid out in year 1 of implementation of the interventions.

f. For year zero (of implementation of the intervention), interest paid was calculated on pro-rata basis depending on the month of implementation. Interest for the full year was paid at the beginning of the year on the amount outstanding.

g. Operation and management costs were included at an average of 1.5percent of the capital expenditure per year for all EE measure types.

15. Assumptions for financial analysis at the project level: In addition to the assumptions for financial analysis at disaggregated, the consolidated financial analysis of the project used the following assumptions:

a. The exchange rate of Indian rupee to US dollar (INR/US$) from 2010 to 2019 was determined based on actual disbursements by the project.

b. For project cost, all expenditures financed by the GEF grant, SIDBI loans, loans from other commercial banks and expenditures financed by the enterprises themselves (i.e., self-finance) was considered. In summary, the project financing covered implementation of 2,386 interventions and design of another 1,997 interventions in 1,365 enterprises. However, verified financial returns data for 1,786 interventions implemented in 1,350 enterprises, and only these were used as financial returns in the analysis. No pro-rata additions were made for enterprises and interventions where data was not available (which include cases where interventions were implemented in FY19-20, and savings/returns had not been verified). Similarly, 1,997 designs for interventions might yield benefit in future but were not included. Also, potential financial returns after 5 years of implementation of the interventions were ignored. These could mean the overall FIRR is a substantial underestimate. However, an underestimation was seen to be more robust than extrapolating the results for enterprises where verified data is not available.

c. Loan repayments were calculated considering maximum loan tenure of 10 years both for SIDBI and other commercial banks who usually lend to MSMEs. All loan repayments were added as “self-finance”.

d. Given that the RF included interest subvention of 2.5 percent nominal and 3.5 percent maximum (and it was probable that the very high FIRR at enterprise level was influenced by such interest subvention), for the 100 cases where enterprises took a loan with interest subvention, the project expenditures were added with an amount to offset the impact. The overall project-level financial analysis, therefore, was not influenced by the interest subvention used in the RF.

e. Financial returns included in the analysis included the cost savings from actual implementation of the EE interventions. Potential savings from interventions yet to be implemented was ignored. The estimates of financial returns did not include GHG emission reductions, as in absence of an active carbon market, no carbon credit was received, and it is uncertain if such credits would be received at the MSMEs in near future. Savings from lean manufacturing and water conservation were not included as financial returns as such savings were measured for the smaller number of MSMEs where lean manufacturing, resource efficiency and cleaner production concepts were introduced, and these do not represent the situation in all MSMEs financed under this project.

f. The financial analysis used FY19 as a baseline. All expenditures and returns during 2011-2019 were adjusted using this historical consumer price index. All future expenditure (loan repayment by MSMEs) and returns were deflated using the inflation rates estimated by the International Monetary Fund. A discount rate of 12 percent is applied based on the "Technical Note on Discounting Costs and Benefits in Economic Analysis of World Bank Projects"[40]

16. Assumptions for economic analysis at the project level: the economic analysis used the following additional assumptions. Note that each of these assumptions applied made the economic analysis conservative.

a. The economic returns from savings in energy were contemporaneous with the commercial returns from EE interventions or savings in expenditure. Economic returns after 5 years of implementation of the interventions should they continue after 5 years of implementation were not included.

b. The economic returns from savings in GHG emission was considered for 15 years after implementation of the intervention mainly to be comparable to the assumptions used at appraisal (where all GHG emission avoidance/reduction was used as the basis for economic justification of the project). Economic returns from reduced water consumption and improved lean manufacturing were considered contemporaneous with the GHG emission reductions.

c. GHG emission savings resulting only from the EE interventions already implemented were included; and all potential GHG savings from future implementation of the planned and designed interventions were ignored (even if the project had financed such plans and designs). The future cost savings accrued due to detailed audits, plans and designs were also ignored.

d. These benefits of this GHG emission reductions were estimated using the low end of the low and high shadow price of carbon specified in the World Bank Guidance Note[41].

e. Conservative estimates of savings from lean manufacturing and water conservation were included as economic returns even if such savings were measured for the smaller number of MSMEs where lean manufacturing, resource efficiency and cleaner production concepts were introduced. However, economic returns due to occupational health and safety measures adopted were not included in the economic analysis, as these benefits were not systematically measured in the project.

f. The economic cost of the project (which includes grants by the project and self-finance by the MSMEs including loan repayment) were calculated by deducting a gross rate of taxation of 15 percent. The general rate of taxes on MSMEs was slightly more than 22 percent when a large number of various taxes and levies used to be applied in India prior to 2018 when the uniform goods and services taxes (with a uniform rate of 18 percent for most of the products manufactured and traded by the MSMEs) were introduced. However, given that some states and commodities used to receive preferential treatment prior to 2018 (under the various tax exemption schemes), a uniform rate of 15 percent was considered a fair representation of the tax regime.

g. Opportunity cost of 18 percent (the maximum rate of interest for retail banking in India) was used to account for giving up other socially or economically useful purposes by SIDBI and other commercial banks in favor of investment in the project. While, this is not a customary practice in economic analysis, this was done to offset the influence of grant financing which leveraged a large amount of loans from commercial banks.

[40] *https://worldbankgroup.sharepoint.com/sites/ggs/SitePages/Detail.aspx/Blogs/mode=view?_Id=2892&SiteURL=/sites/ggs*.
[41] World Bank Guidance Note on the Shadow Price of Carbon in Economic Analysis (November 2017)

Project Cost

17. The total grant financing was INR 900.8 million. The SIDBI provided loans of INR1,116.3 million during the project implementation period for implementation of the EE interventions recommended by IGDPRs based on detailed audits conducted by the project. The MSMEs availed a total loan of INR 135.7 million from other commercial banks they usually did business with (and did not approach SIDBI for loans even if they were eligible). In addition, MSMEs invested INR 540.9 million of their own money to implement some of the interventions recommended in the respective IGDPRs (and did not approach any bank or SIDBI for loans) and were currently implementing additional recommended interventions worth INR 111.4 million. MSMEs were also repaying the loans from SIDBI and the other commercial banks. The total repayment of such loans already taken is INR 3580.7 million[42]. No default in loan repayment had been observed by SIDBI (and it is assumed to hold true for the other commercial banks). Overall, the grant financing of INR 900.8 million leveraged directly attributable additional financial resources of INR 4,742.8 million, and financial leveraging ratio of 5.25.

Project Benefits

18. The benefit data was based on results from 548 enterprises (48 percent of the total 1,133 enterprises covered by the project) which implemented a total of 1,786 cases of energy-efficiency interventions (75 percent from the 2,386 specific interventions implemented in the project) where detailed expenditure and cost savings data were available and were verified. These 548 enterprises saved energy to the tune of 13,286 tons of oil equivalent annually, entailing 68,000 tCO_2e emission reduction annually or lifetime emission reduction of 1.02 million tCO2e. Additionally, these enterprises reduced emission of 1005 tons of Sulphur Oxides, 301 tons of Nitrogen Oxides, and 14,835 tons of Suspended Particulate Matters (PM10) annually. By the close of the project, emission reduction results from 1,067 enterprises were available, and these were included in the economic analysis totaling an emission reduction of 2,716,697 tons of CO_2e over 15 years of life post-implementation of the interventions. However, for financial and economic analysis only the verified data from 548 enterprises which started receiving financial cost savings were included.

19. Potential benefits would also result from implementation of the other IGDPRs that were produced, and a total of another 1,997 specific interventions recommended by the IGDPRs are expected to be taken up for implementation. The energy audits conducted, the documentation of IGDPRs had also saved cost of such audits and preparation of IGDPRs in future. However, these are not included as benefits at ICR.

20. Measures promoting resources efficiency and cleaner production further resulted in savings in water consumption, reduction in raw material consumption and reduction of wastages. Overall occupational health and safety conditions improved most notably in forging and foundry industries. Where brick lining of furnaces was replaced with refractory lining, the surrounding temperature of furnace was reduced by 50 percent from 120oC. Since Bank safeguards was streamlined in the entire project cycle, lean manufacturing, good housekeeping measures, and occupational health and safety measures implemented in these enterprises helped reduce risk of accidents. Other than a few sectors where the savings due to reduced water consumption, and reduced wastage of raw materials were substantial, these improvements could not be quantified.

[42] Note that this amount of INR 3580.7 million of loan repayment is estimated based on the actual interest rate of 9 percent applied by SIDBI with loan tenure varying between 3 to 10 years. However, for the financial analysis for the project as a whole, to avoid the influence of interest subvention of 3.5percent by the project, the rate of interest was considered to be 12.5 percent with a tenure of 10 years. In that case, the total amount of loan repayment considered in the financial analysis at ICR was INR 4090.3 million.

21. Implementation of EE measures came with production downtime on installation of new equipment or retrofitting of old. This along with person-hours lost to training on the new equipment impacted the production of enterprise for initial two to three weeks, as reported by the MSMEs were offset by the improved efficiency of the workers employed afterwards. These gains in productivity could not be quantified.

Financial analysis for enterprises receiving Non-RF support

22. In addition to the initial grant of USD11.3 million, an additional grant of USD5.19 million was available and used after December 2016 in the project. Since a Revolving Fund (RF) was created in 2014, from the total disbursed grant in the project, disbursement for the non-RF activities in the project was USD8.9 million which also include a performance-linked grant (PLG) of USD0.4 million. Overall, EE interventions were implemented in 1033 enterprises, where 3,847 specific interventions were designed but 1,850 of these were implemented until close of the project.

23. A total of 1,250 cases of energy-efficiency interventions (67 percent from the 1,850 specific interventions implemented) were analyzed across 448 enterprises (43 percent of the total 1,033 enterprises covered by the project) where detailed expenditure and cost savings data were available. While these 448 enterprises were spread across 16 clusters, five clusters accounted for 95percent firms (Ankaleshwar, Belgaum, Faridabad, Kolhapur and Pune). These enterprises belonged to 20 sectors, with 11 sectors accounting for 94percent of the firms (Auto components, Chemical, Die casting, Engineering, Forging, Foundry, Heat Treatment, Manufacturing, Plastic, Sheet Metal and Textiles).

24. Of the 448 enterprises, 441 had a positive FIRR and notably 196 firms had financial internal rate of return (FIRR) more than 100 percent. Only 7 enterprises had a negative FIRR as savings and financial returns for a ceiling period of 5 years post-intervention were considered. For each of these 7 cases, FIRR turns positive if returns for 2 more years (i.e., 7 years post-intervention in total) were to be considered. The high financial profitability of EE measures is evident from the fact that out of 448 firms, only 41 had FIRR below 20 percent as compared to 196 cases with FIRR higher than 100 percent. In cases of enterprises that had FIRR higher than 100 percent, a closer look revealed that these enterprises had very high cost savings from small improvements, such as improving insulation or replacing furnace lining.

25. Moving beyond enterprises level analysis, a further drilled-own financial analysis was attempted at intervention level as enterprises had implemented multiple EE measures. Under this, financial viability of each measure was calculated, and results indicate that 1,220 interventions out of 1,250, i.e. 98 percent were profitable (positive FIRR). Note that several enterprises implemented multiple interventions, and therefore the enterprises could achieve positive commercial returns despite the 30 specific interventions where returns were negative.

26. The Financial Analysis also examined trends or variations in achievement of FIRR: (i) among micro, small or medium segments of MSMEs; (ii) across clusters; and (iii) across sector. For this analysis, the outliers, i.e., the 196 enterprises or 403 interventions where FIRR exceeded 100 percent were ignored. It was found that there was no noticeable difference in the FIRR achieved by micro, small or medium segments of MSMEs. Three clusters had comparatively higher FIRR. The Ludhiana cluster with 11 EE interventions had an average FIRR of 58 percent, the Faridabad cluster with 298 interventions had an average FIRR of 51 percent, and the Varanasi cluster with 11 interventions had an average IRR of 31 percent.

Financial analysis for RF enterprises

27. A revolving fund was established at SIDBI for commercial loans of US$25 million in December 2016 to facilitate interest subvention up to 3.5percent. This facility at SIDBI was supported by a grant financing of US$5.2 million from the project. Approved enterprises (termed as RF companies) received part/full funding for the EE interventions from

this fund, while parts of implementation were funded by these companies from their own funds or from other banks at commercial rates of interest. Enterprises which did not avail funding from SIDBI (non-RF companies) were also eligible for a PLG depending on the amount of investment. These RF funds were utilized by 100 companies for a total of 536 interventions.

28. A firm level financial analysis for the enterprises who availed loan from the revolving fund could not be attempted (like the enterprises that received the non-RF support) and aggregation of interventions was used as a proxy because full financial statements at baseline (before intervention) and end line (after intervention) was not available for these firms/enterprises, some of whom have received loans in the names of their holding companies). The financial analysis was undertaken for EE interventions using data and analysis from the Monitoring and Verification done under the project. The Monitoring and Verification reports recorded expenditure/investment data for each intervention and verified and recorded the resultant benefits from each specific intervention. Although these data could not be strictly correlated to the loan amounts that the enterprise/company took and the overall financial statement of the enterprise/company was unavailable for verification, if the broader firm level financial situation is considered as ceteris paribus, the results hold true for the enterprise/firm.

29. Of the 108 RF-companies, the cases of 100 of them were verified and recorded until the last financial year. In these 100 revolving fund cases, enterprises implemented EE measures with financial loan from SIDBI's were analyzed. These enterprises were spread across 15 states, but 6 states accounted for 80 percent of the firms (Gujarat, Haryana, Karnataka, Maharashtra, Punjab, Tamil Nadu). FIRR calculation showed that 79 firms had positive IRR, with 39 having FIRR above 100 percent. Negative IRR cases are primarily because of larger loan size and lower benefits in first five years. As data was not available for these cases after the loan repayment period (3-5 years), it is possible that returns were underestimated in these cases. Like non-RF cases, enterprises which had an IRR of above 100 percent, large benefits were obtained by low cost operational improvements.

Overall Financial Analysis

30. **Table 4.2** presents the summary of financial analysis of the project as a whole (as distinguished form the enterprise-level financial analysis). The ICR found that the internal rate of financial return to be 33.3 percent considering all expenditure from the grant and the leveraged financial resources as a whole. Note that if the interest on loan repayment was considered to be 9 percent given that a maximum of 3.5 percent of interest subvention was available under the SIDBI revolving fund supported by the project, the actual internal rate of financial return would be 36.7 percent. The project achieved very robust internal rate of financial return irrespective of the project-promoted interest subvention. Considering a part of the expected financial returns were not included (see assumptions listed in forgoing paragraphs), this FIRR of 33.3 percent is a very conservative estimate, but comfortably exceeds the estimate at appraisal (20-25 percent as implicitly stated, or 23.6 percent as reconstructed from assumptions at appraisal).

Overall Economic Analysis

31. **Table 4.3** presents the summary of economic analysis for the project. The benefit exceeded the cost ratio by 35.8 times when only the GEF grant is considered, or 6.2 times when the grants and the leveraged financial resources were considered together. The internal rate of economic return at ICR was found to be 68.1 percent for the combination of expenditures from the grant and the leveraged financing from SIDBI, the commercial banks and self-investment by MSMEs. This is a robust but very conservative estimate of economic return considering that a large number of potential economic benefits were ignored in this analysis at ICR (see assumptions listed in forgoing paragraphs). Even then this conservative estimate of internal rate of economic return far exceeds the assumptions

at appraisal (12 percent as implicitly stated or 16.8 percent as reconstructed based on assumptions stated in the project appraisal document).

Global Environment Benefit and Incremental Cost Analysis

32. An efficiency analysis for the global benefits (i.e., GHG emission avoided per unit of GEF grant) was reported in the project appraisal document. With project intervention, it was expected that an incremental 4.8 million tons of CO_2e emissions will be avoided over the lifetimes of the EE intervention (assumed to be 10 years after being implemented) compared to the business-as-usual scenario (which also reduced CO_2e emission over the same period). The GEF grant was expected to leverage an incremental energy-efficiency investment of US$59 million consisting of (a) US$46 million direct capital investments in 5 project clusters; and (b) indirectly facilitating energy-efficiency investments worth US$13 million in 25 additional clusters influenced by the BEE. Therefore, the cost-effectiveness of the GEF grant of US$11.3 million was considered as follows: (a) US$2.84 per ton of CO_2e emission avoided in the 5 project clusters, and (b) US$2.37 per ton of CO_2e emission avoided in the entire project due to the combination of direct and indirect interventions.

33. During initial years of project implementation, it was experienced that the unit rates assumed for analysis at approval were significantly higher. It was also learnt that adopting unit rate of investment per MSME is not a practical assumption since enterprises implement identified EE investments in stages and not all at once. Therefore, at restructuring and AF thereon, targets were split into' ER resulting from direct investments' and 'estimated potential and replicable ERs'.

34. During AF it was targeted that total GEF grant of US$ 16.49 would incrementally avoid 2.55 million tons CO_2e due to direct investments in 26 project clusters and 6.6 million tons CO_2e due to potential investments in 51 clusters (26 project and 25 BEE clusters), thereby avoiding a total of 9.15 million tons of CO_2e across 51 clusters.

35. At project closure, US$14.08 million of GEF grant was disbursed. A total of 16.06 million tons of CO_2e was avoided incrementally in 51 clusters and 2.72 million tons of CO_2e due to direct investments. The cost effectiveness of GEF funds achieved was US$ 0.87/ton of CO_2e ER when including project impact across all 51 clusters; and US$5.17 when only including the direct impacts of the project. Details are as per Table .

Table 4.1: Incremental Cost Matrix

	At Project Approval	Revised at AF	Actual Achieved at Completion
GEF Fund	US$ 11.3 million	US$ 16.46 Million	US$ 14.08 million
No. of Clusters	Project: 5 BEE: 25 Total: 30	Project: 26 BEE: 25 Total: 51	Project: 26 BEE: 25 Total: 51
ER in BAU scenario	2.5 million tons of CO_2	4.25 million tons of CO_2 (extrapolated)	Not applicable
Domestic environmental benefit (due to direct investments)	Reduction of 3.98 million tons of CO_2 emissions	Reduction of 2.55 million tons of CO_2 emissions	Reduction of 13.34 million tons of CO_2 emissions
Global Environmental Benefit (due to direct and indirect investments)	Reduction of 4.8 million tons of CO_2 emissions	Reduction of 9.15 million tons of CO_2 emissions	Reduction of 16.06 million tons of CO_2 emissions

	At Project Approval	Revised at AF	Actual Achieved at Completion
Cost to GEF	$2.84 GEF$/incremental ton avoided for 5 project clusters only $2.37 GEF$/incremental ton avoided for direct and indirect impacts in 30 clusters	$6.46 GEF$/incremental ton avoided for direct impacts in project clusters only $1.8 GEF$/incremental ton avoided for direct and indirect impacts in 51 clusters	$5.17 GEF$/incremental ton avoided for direct impacts in project clusters only $0.87 GEF$/incremental ton avoided for direct and indirect impacts in 51 clusters

Table 4.2: Summary of Financial Analysis

Year	N Year from 2011	Discounts	CPI	Adjustment Factor	Project Cost (Grant)	Self-Finance by MSMEs	Loans Repayment by MSMEs	SIDBI Loans	Loans from Other FIs	Total Self-Finance	Cost Savings (Non-Revolving Fund)	Cost Savings (Revolving Fund)	TOTAL FINANCIAL RETURN (Gross Financial Return Less Financial Cost of MFD Less Self-Finance)
2,010	-		11.989	198.494	-	-	-	-	-	-	-	-	-
2,011	-	1.0000	8.858	174.696	93.06	-	-	870.55	42.34	36.51	-	-	(129.57)
2,012	1	0.8929	9.312	159.222	49.22	-	128.23	1,416.86	51.68	186.98	(25.87)	-	(286.44)
2,013	2	0.7972	10.908	144.395	372.12	277.97	309.27	2,868.12	209.25	587.24	(882.86)	-	(1,900.95)
2,014	3	0.7118	6.353	128.644	1,421.73	442.23	668.81	3,194.08	277.42	1,111.04	3,453.83	-	794.05
2,015	4	0.6355	5.872	120.472	637.93	554.64	1,060.55	1,907.63	324.74	1,615.19	910.82	-	(1,543.71)
2,016	**5**	0.5674	4.941	113.397	930.31	621.52	1,215.36	448.90	85.78	1,836.87	4,614.12	(1,334.14)	282.00
2,017	6	0.5066	2.491	107.795	496.99	527.51	1,109.90	762.01	46.33	1,637.41	4,810.47	(1,252.69)	1,212.60
2,018	7	0.4523	4.861	105.109	654.40	459.26	1,087.85	1,326.83	5.76	1,547.10	5,397.13	(1,231.68)	1,757.36
2,019	8	0.4039	*4.790*	100.000	331.45	97.53	1,119.59	1,408.85	4.89	1,217.12	2,475.61	3,576.85	4,291.27
2,020	9	0.3606	*4.600*	95.602	238.85	83.25	1,164.10	549.75	-	1,247.35	2,373.08	4,255.74	4,921.55
2,021	**10**	0.3220	*4.600*	91.398	-	71.06	1,074.71	-	-	1,145.78	505.63	3,624.58	2,780.34
2,022	11	0.2875	*4.900*	87.129	-	60.48	892.14	-	-	952.62	186.05	2,855.76	1,919.76
2,023	12	0.2567	*4.900*	83.059	-	51.48	721.31	-	-	772.79	-	1,855.02	945.25
2,024	13	0.2292	*4.700*	79.330	-	43.90	531.17	-	-	575.07	-	497.18	(178.76)
2,025	14	0.2046	*4.700*	75.769	-	4.69	351.45	-	-	356.14	-	-	(422.88)
2,026	**15**	0.1827	*4.600*	72.437	-	-	233.35	-	-	233.35	-	-	(277.66)
2,027	16	0.1631	*4.600*	69.251	-	-	182.97	-	-	182.97	-	-	(217.72)
2,028	17	0.1456	*4.600*	66.206	-	-	131.53	-	-	131.53	-	-	(156.51)
2,029	18	0.1300	*4.600*	63.294	-	-	72.43	-	-	72.43	-	-	(86.19)
2,030	19	0.1161	*4.500*	60.569	-	-	19.37	-	-	19.37	-	-	(23.05)
2,031	**20**	0.1037	*4.500*	57.961	-	-	-	-	-	-	-	-	-
2,032	21	0.0926	*4.500*	55.465	-	-	-	-	-	-	-	-	-
2,033	22	0.0826	*4.381*	53.137	-	-	-	-	-	-	-	-	-
2,034	23	0.0738	*4.340*	50.927	-	-	-	-	-	-	-	-	-
2,035	24	0.0659	*4.298*	48.828	-	-	-	-	-	-	-	-	-
Sum or NPV					**5,226**	**3,296**	**12,074**	**14,754**	**1,048**	**15,465**	**23,818**	**12,847**	**13,681**
IRR (Overall including Project Grant and Leveraged Finance)													**33.30%**

All Values are in INR (100,000)

Table 4.3: Summary of Economic Analysis

Year	N Year from 2011	Project Cost (Grant)	Economic Cost (Project Cost Less Taxes @15%)	SIDBI Loans	Loans from Other FIs	Total Self-Finance	Opportunity Cost of Loans or MFD Less Taxes @18%	Net Cost Saving of MSMEs	Energy Saving of Activities through Non-Revolving Fund	Energy Saving of Activities through Revolving Fund	tCO2C Saving	Price of GHG Savings (Low Estimate) in USD	GHG Reduction	Water Savings	Lean Manufacturing	TOTAL NET ECOMONIC BENEFIT
2,010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,011	-	93.06	79.10	870.55	42.34	36.51	-	(129.57)	-	-	-	-	-	-	-	(240.80)
2,012	1	49.22	41.84	1,416.86	51.68	186.98	24.37	(286.44)	-	(26.37)	-	32.00	-	-	-	(546.88)
2,013	2	372.12	316.30	2,868.12	209.25	587.24	58.73	(1,900.95)	-	(899.51)	2,733	33.00	133.50	0.06	-	(3,566.71)
2,014	3	1,421.73	1,208.47	3,194.08	277.42	1,111.04	127.01	794.05	-	3,407.22	10,996	34.00	581.27	30.18	-	2,482.20
2,015	4	637.93	542.24	1,907.63	324.74	1,615.19	201.41	(1,543.71)	-	867.19	27,520	35.00	1,414.52	27.46	0.00	(1,427.02)
2,016	**5**	930.31	790.76	448.90	85.78	1,836.87	230.80	282.00	(1,491.75)	4,571.63	52,307	36.00	2,759.62	35.03	9.73	3,496.76
2,017	6	496.99	422.44	762.01	46.33	1,637.41	210.78	1,212.60	(782.65)	4,780.69	85,356	37.00	4,652.96	41.90	9.55	7,812.17
2,018	7	654.40	556.24	1,326.83	5.76	1,547.10	206.59	1,757.36	(1,286.94)	5,373.54	126,667	38.00	6,625.20	49.60	18.01	10,384.32
2,019	8	331.45	281.73	1,408.85	4.89	1,217.12	212.62	4,291.27	3,955.63	2,465.38	132,667	39.00	7,082.60	20.92	63.84	16,285.23
2,020	9	238.85	203.02	549.75	-	1,247.35	221.07	4,921.55	3,797.00	2,365.69	181,112	40.00	9,550.79	20.37	130.62	19,234.10
2,021	**10**	-	-	-	-	1,145.78	204.10	2,780.34	3,559.87	499.63	181,112	41.00	9,365.84	17.15	113.36	15,095.99
2,022	11	-	-	-	-	952.62	169.42	1,919.76	2,868.59	182.98	181,112	42.00	9,146.12	10.26	110.16	13,207.03
2,023	12	-	-	-	-	772.79	136.98	945.25	1,656.59	-	181,112	43.00	8,926.48	10.27	93.35	10,796.23
2,024	13	-	-	-	-	575.07	100.87	(178.76)	130.90	-	181,112	44.00	8,624.91	10.30	56.07	8,022.73
2,025	14	-	-	-	-	356.14	66.74	(422.88)	-	-	181,112	45.00	8,427.11	10.33	56.23	7,681.54
2,026	**15**	-	-	-	-	233.35	44.31	(277.66)	-	-	181,112	46.00	8,237.55	10.37	56.44	7,771.01
2,027	16	-	-	-	-	182.97	34.75	(217.72)	-	-	181,112	47.00	8,134.92	10.41	56.66	7,783.77
2,028	17	-	-	-	-	131.53	24.98	(156.51)	-	-	178,378	48.00	7,822.74	10.45	56.88	7,589.42
2,029	18	-	-	-	-	72.43	13.76	(86.19)	-	-	170,116	49.00	7,280.91	10.49	57.09	7,182.94
2,030	19	-	-	-	-	19.37	3.68	(23.05)	-	-	153,592	50.00	6,418.99	10.54	57.37	6,442.63
2,031	**20**	-	-	-	-	-	-	-	-	-	128,805	51.00	5,254.30	10.59	57.64	5,322.53
2,032	21	-	-	-	-	-	-	-	-	-	95,756	52.00	3,847.88	10.64	57.92	3,916.43
2,033	22	-	-	-	-	-	-	-	-	-	54,445	53.00	2,135.92	10.71	58.26	2,204.89
2,034	23	-	-	-	-	-	-	-	-	-	48,445	55.00	1,855.54	10.77	58.63	1,924.94
2,035	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum or NPV		**5,226**	**4,442**	**14,754**	**1,048**	**15,465**	**2,293**	**13,681**	**12,407**	**23,588**			**128,280**	**379**	**1,178**	**158,855**
B/C Ratio (Project Grant only)																35.76
B/C Ratio (Project Grant + Leveraged Finance)																**6.15**
IRR (Overall including Project Grant and Leveraged Finance)																**68.13%**

All Values are in INR (100,000) unless indicated

ANNEX 5. ESTIMATED REPLICATION POTENTIAL IN MSMEs

1. The potential total replicable EE investments in MSMEs is estimated as INR 16,971 million which will potentially result in 13.34 million ton of CO_2 emission reduction. This replication potential is indicative of the overall impact – direct and indirect, of FEEMP in terms of EE investment and carbon emission reduction in the project focused MSME clusters.

2. The total replication potential has been estimated for 14 project clusters where more than 186,000 enterprises are operating. The results of independent 3rd party Impact Evaluation of 4 clusters covered under parent project has been considered as the basis for estimating the replication potential in remaining 10 clusters. During project period, direct interventions were undertaken in 1257 enterprises by project, which is less than 1 percent of total MSME units. The project identified more than 8,500 EE interventions in these 1257 MSMEs covering 15 different energy-intensive sectors by providing complete end-to-end handholding support including WTA, DEA, IGDPR, Vendor identification, finalization of technical specifications, commissioning support, finance syndication with the FIs and post implementation M&V. Of the 1257 MSMEs, 1067 enterprises implemented EE measures but not all. Potential in 10 clusters has been extrapolated based on the following findings of Impact Evaluation report and project experience:

(a) Replicable potential for remaining enterprises has been conservatively taken as 10 percent because:
   (i) Impact Evaluation Report observed that in 4 clusters 10 percent of participating MSMEs implemented 10 percent of identified EE Investment;
   (ii) The project has been able to sensitize more than 6000 entrepreneurs whereas IGDPRs were prepared for only 1257 enterprises. After deduction of 224 RF enterprises, the conversion ratio from sensitization to IGDPR is 7:1 (14 percent) under the project.

(b) It was verified that all the identified proposals were not implemented by the industries during project period due to several reasons such as financial, technical, etc. The difference between identified potential and actually implemented by the enterprises during project period has also been considered.

(c) The Project has successfully implemented Revolving Fund by SIDBI and completed its 1st cycle. The payback from the enterprises has been revolved and RF is in its 2nd cycle. Based on achievement of 1st cycle, the replication potential has been proportionately calculated for two more cycles.

3. Table 5.1 provides further details of estimated replication potential based on actual verified results

4. Additionally, BEE has undertaken Impact Evaluation in 26 clusters that were not part of the project. As part of evaluation, a total of 1,162 MSMEs were surveyed and results verified in terms of EE Investment and emission reductions. Of 1,162 MSMEs, total 988 MSMEs implemented few energy efficiency measures with an investment of INR 281 million. These investments resulted in INR 156 million of cost savings through 4,934 toe of energy savings and 0.38 million ton of lifetime CO_2 reduction.

5. Complete detailed workout of the replication potential has been undertaken by SIDBI and available as part of their ICR.

Table 5.1: Replication Potential based on actual verified results

Overall Coverage	Based on (Avg. Implemented)			Remark
	No. of MSMEs (Nos.)	Investment Potential (INR Mn)	Lifetime GHG Reduction (Mn T CO_2)	
14 Clusters (IGDPRs)	1,257	3,829	4.83	Identified Leftover Investment and ER after project closing
14 Clusters (Remaining MSME units)	21,307	9,413	10.93	Four clusters potential was estimated by CII through M&V and based on the results it is observed that 10 percent MSMEs will actually implement 10 percent of EE Investment and ER in 10 remaining clusters
Revolving Fund (Cycle-2nd & 3rd)	448	3,729	1.83	There is a provision to revolve the EE loan scheme fund for two more times after 1st cycle.
Total	**23,012**	**16,971**	**17.59**	

6. With BAU, 4.25 million tons of CO_2 reduction was envisaged. Therefore, total lifetime emission reduction is 13.34 million tons of CO_2.

ANNEX 6. BORROWER, CO-FINANCIER AND OTHER PARTNER/STAKEHOLDER COMMENTS

1. Comments received from SIDBI

sidbi

Ref no: SIDBI/GC&SDI/L002178314 **November 01, 2019**

Mr. Tapas Paul
Lead Environmental Specialist
World Bank, India Country Office
70 Lodi Estate, New Delhi
India -110003

Dear Mr. Tapas

India: Financing Energy Efficiency at MSMEs- TF097126-IN

Thank you for sharing the Implementation Completion Results Report (ICRR) of Financing Energy Efficiency at MSMEs (FEEMP). The results of the project and Highly Satisfactory rating given to the project have been greatly appreciated by the management of SIDBI and we appreciate partnership with the World Bank for implementing the project successfully. In addition to delivering the results beyond the agreed targets, the project has established several initiatives of national importance to sustain the results. While the ICR has referred to these aspects, the following details may be substantiated:

Long Term Sustenance of the initiatives under the project: SIDBI has created a separate division, Green Climate and Sustainable Development Initiatives (GC & SDI) to promote Energy Efficiency and Cleaner production in the MSME sector through Green Financing and promote EE and sustainable development in the MSME sector for their survival, growth and competitiveness in long run by providing appropriate financing products.

End to End Energy Efficiency Solutions (4E solutions) Program: SIDBI has created 4E Program with the objective of scaling up the successful WB-GEF project results to other MSMEs in pan India. Under the program, SIDBI provides technical support to its MSME clients to improve their energy savings by availing the services of technical consultants at a reasonable cost with assurance on the quality of services and provide loans for eligible MSMEs towards implementation of EE project at competitive interest rates. This 4E Solutions linked with the financing product has also been developed using revolving fund which was created within the FEEMP WB-GEF project to provide loans for retrofit based energy efficiency projects to MSMEs at attractive interest rates and on softer terms. Till the FEEM project closure, total 109 MSMEs have availed the loan facility and made an investment of INR. 1717 million towards implementation of EE technologies under 4E Program through SIDBI and benefited towards reduction of energy and cost savings.

Scaling up FEEMP Initiatives: SIDBI has been accredited by GCF as one of "National Implementing Entity" to provide finance for implementing climate change projects in the developing countries like India. SIDBI will enhance manifold its sustainable development initiatives and implement more innovative schemes, replication and up-scaling of FEEM project to promote Energy Efficiency and projects to combat climate change.

Contribution to National MSME Programs: In addition to recognition of proof of RECP concepts under INDC document of India, SIDBI through FEEMP has contributed to several national level

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initiatives such as Zero Defect and Zero Effect (ZED), and National MSME competitiveness recognized by Ministry of MSME.

Tools for awareness building and scaling up RECP Initiatives: SIDBI has created Energy Efficiency Assessment Tool for MSMEs (EE Tool) and a mobile application by the name Resource Efficiency (RE) Assessment Tool under FEEMP. The EE Tool, developed with the objective of knowledge sharing and scaling up EE Interventions at MSMEs, can estimate the potential energy and monetary savings along with suitable EE Measures for any similar MSME sectors based on repository of previous studies and implementations. The EE Tool has been hosted at one of SIDBI subsidiary i.e. India SME Technology Services Limited (ISTSL) website (http://eetool.istsl.in/). The RE Assessment Tool has helped to standardized, digitalized, real-time monitoring and automatic report generation, thereby reducing study time and enhance consistency with standardization of DPRs. The user can do a detailed assessment for mainly three areas i.e. energy efficiency, lean manufacturing and cleaner production at their facilities either manufacturing or service. Both the tools are useful for all energy professionals, lean and clean consultants, cleaner production professionals, MSMEs and students, banks/FIs, any other Govt. / private entity as per their relevance and requirements; and are available in public domain.

Further, our comments on the ICRR are given in **Annexure.**

SIDBI looks forward to continuing collaboration with the World Bank in future.

Yours faithfully,

(M.K Pandey)
General Manager

Annexure

SIDBI comments on ICRR

Clause No.	As per WB ICSR	SIDBI comments
Header Section	Financing Energy Efficiency at SMEs	Financing Energy Efficiency at MSMEs
Section 39.	Last paragraph on Page no. 15: "However, EE Investment materialized only in 16 clusters"	This line to be modified as under: "However, major EE investment materialized in **20 clusters** and investments are still under progress in remaining clusters"
Section 42.	1120 personnel from 75 FIs	1120 personnel from 75 FIs/**Banks/NBFCs/CAs** Please modify this wherever it is mentioned in ICRR.
Section 43 and Section 51. (c)	Incentivize 500 units	Incentivize to **67 u**nits under PLG
	One-time cash payment	To be replaced by "**performance based incentive**"
	upto INR 900,000 at 75% of capital expenditure upon demonstration of achievement of actual energy savings"	Since, it is related to SIDBI PLG, please replace the same as under:- "from INR 2 lakh upto INR 10 lakh to MSMEs meeting the eligibility criteria and upon measurement & verification of achievement of actual energy savings"
	INR 900,000/-	
Section 44 , Section 51. (d) and Section 89.	Interest subvention of upto "2.5% and 3.5"	To be replaced with " upto 3.85% based on credit rating of MSME unit"
Section 51. (c)	"one-time cash payment"	To be replaced by "performance based incentive"
Section 51. (d)	108 MSMEs	109 MSMEs
Section 94.	Last paragraph starting from "This meant reduction ....."	As per our opinion it should not be mentioned.
Annexure-1.	A.1 PDO Indicators – "Objective/Outcome"	Mentioned several time and repeating the same at other similar sub-sections at page nos. 33 to 37, please check and correct.

2. Comments from BEE

ऊर्जा दक्षता ब्यूरो
(भारत सरकार, विद्युत मंत्रालय)
BUREAU OF ENERGY EFFICIENCY
(Government of India, Ministry of Power)

150 YEARS OF CELEBRATING THE MAHATMA

F. No. GEF-WB-BEE/ICR/2019 **November 18, 2019**

Mr Tapas Paul,
Lead Environmental Specialist
World Bank, India Country Office
70 Lodi Estate, New Delhi 110003
India

Subject - Comments to the Implementation Completion Result Report (ICRR).

Dear Sir,

Thank you for sharing the Implementation Completion Report of GEF-WB-BEE project 'Financing Energy Efficiency at MSMEs'. It is pleasure to observe the project received highly satisfactory rating. This project has gone through remarkable experience and ended at highly appreciated note. In this regards, Bureau of Energy Efficiency is extremely thankful in partnering with World Bank and SIDBI jointly implementing 'Financing Energy Efficiency at MSMEs project successfully. We use this opportunity to specially thank all the team members who were involved in this project in this 10 yearlong association and journey.

We received the ICCR on 24th October via e-mail. We were requested to share our comments to the ICRR as earliest but timeline for provide our comments with-in 23rd November 2019. As requested, we happy to share our comments and opinions on the ICCR in advance.

The ICRR has excellently drafted and has covered the right aspects and expresses good takeaways. We hope our ICR has significantly supported in this regard. Following are bureau's comments on this report.

- In the context of project appraisal, it is indicated the project was prepared during the time of global economic distress and India was preparing to revive the economic growth. FEEMP was established primarily to meet the MDG, the mission identified manufacturing sector especially MSMEs could be the right area of implementation due to existing state of industrial practices, large share of energy demand, opportunities for energy savings and emission reduction. Henceforth, the project was designed to introduce EE measures in MSMEs at scale to improve global competitive advantage of MSMEs and reduce pollution. Additionally, the appraisal has also referenced India's commitment to reduce carbon intensity by 20-25%.

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How this project fared in achieving the MDG as envisaged? and how the project achievements contributed to our national commitments.

- We believe post closure of this project, some of the visible materials such as web portal and Knowledge Management is the only gateway for various stakeholders to examine the project related activities, experiences, case studies, knowledge bank and more. It would be appreciated if a dedicated section in ICCR provides enhanced coverage of information.

Further please find the attached annexure for additional comments.

Yours Sincerely,

(Milind Deore)
Director

Enclosed: As Above

BEE's Observations and Comments on the ICCR

Section	As per WB ICR	Comments
2	Last line in para 2	Change 'Annual Action Plan on Climate Change' to '**National Action Plan for Climate Change**'.
5	MSMEs did not have access to...	Hope this sentence could be softened. May be '**MSMEs had limited access to business**..... Change the word from 'unorganized' to '**informal**'
8	Cross reference to the table is missing	Table not linked with the text. There is an **Error! Message**.
47	Certification of ISO50001 is subjected to meeting certain requirements over a period and **shall be** awarded to the participating.....	Change 'shall be' to '**has been awarded**'
56	Cumulative lifetime carbon ERs.....	5th line has a **missing foot note**
74	The whole paragraph requires more contents	**This para maybe revisited,** The project has outreached several MSMEs gathered comprehensive repository of information, knowledge assets well documented in the web portal. The ICR should cover key features of the web portal. (number of experts, manufacturers, suppliers onboard), E-News Letters, Training manuals and other.
109	Clarification to the line. In BEE, the last phase experienced some procurement delays due to frequent change of procurement experts	**This para maybe revisited,** Impact evaluation was supposed to undertake by BEE. BEE through MOEFCC and DEA had requested for extension in its timeline till September 2019 to foresee closure procedures and conduct impact evaluation. This proposal was denied by the World Bank and unfortunately this activity has been terminated due to not providing extension required extension.

Section	As per WB ICR	Comments
109	Clarification to the last line in the paragraph 'Delay in making payment was evident in several PPRs'	There was no delay in payments unless the consultant not met their proposed deliverables. Delay could be due the complicated procurement process, the project requires acceptance and approval from the World Bank on Term of References (ToR), Bid Process and so on.
112	'No impact due to procurement delays or limited competition were reported except in the last two years of implementation for the activities managed by BEE'	**Cannot be accepted**. In our opinion, changes in management never delayed activities. Delay could be due the complicated procurement process, the project requires acceptance and approval from the World Bank on Term of References (ToR), Bid Process and so on. BEE has been co-operative throughout in every activity involved. WB may revisit on these lines or may be removed.
95 and 117	Industrial slowdown impacted.....	Industrial Slowdown' impacted implementation progress. **Please justify this**
121	The project faced challenges from UNIDO and UNDP working in same clusters....	**Not true,** The cluster under UNIDO and WB projects were entirely different and has no similarity in nature. The challenge expressed may not be true and not accepted. The objective of UNIDO and UNDP may be different and limited to a certain scope of work.
121	UNIDO and UNDP do not provide any support to MSMEs beyond energy audit	How relevant is this line? Try to avoid to comment about other projects activities.
125	Lesson 2 (i) No-duplication of efforts in same clusters by regulating the agencies involved.....	There has been no such case and BEE's programmes assures there is no duplication of efforts in the same cluster.

Section	As per WB ICR	Comments
128	Lesson 4 Willingness of MSMEs to invest without availing lending	In our opinion, 'Attracting investment with-out lending' may be a barrier to EE. Loans with attractive rates are major drivers for creating market for EE technologies.
129	Though MSMEs would like to work with a consultancy to provide them end-2 end support, **ESCOs are not preferred**.	**This paragraph may be revisited**. This paragraph may be baseless, the services and financial models from ESCOs are case sensitive.
Page 37, 38	Annex 1 Results Framework and Key output	Please avoid using decimals for numbers
Page 38	Annex 1 Results Framework and Key output	**EE Demonstration Videos (6 in the Parent Phase** and **6 in the AF phase**, total **12 Actual achieved.**
Page 38	Annex 1 Results Framework and Key output	Change 'Component' to **Component 3**
Section 24 and Page 38	Annex 1 Results Framework and Key output	The intermediate indicators never had targets.

ANNEX 7. SUPPORTING DOCUMENTS

1. Project Appraisal Document for FEEMP
2. Restructuring Paper of FEEMP
3. Project Paper on AF of FEEMP
4. FEEMP ISRs
5. FEEMP Aide Memoires/Management Letters
6. FEEMP Midterm Review Report
7. FEEMP Performance Linked Grant Scheme Details
8. Operating Guidelines of Revolving Fund
9. Implementation Completion Report of SIDBI
10. Implementation Completion Report of BEE
11. World Bank India Country Assistance Strategy (2009-12)
12. World Bank India Country Partnership Strategy (2013–17)
13. World Bank India Country Partnership Framework (2018-22)